THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

[REGISTERED AS A NEWSPAPER.]

VOL. XXV. No. 620.] LONDON, MARCH 30, 1875. [27TH YEAR.] Price 6d.

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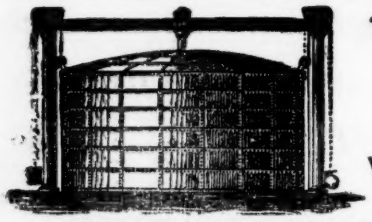

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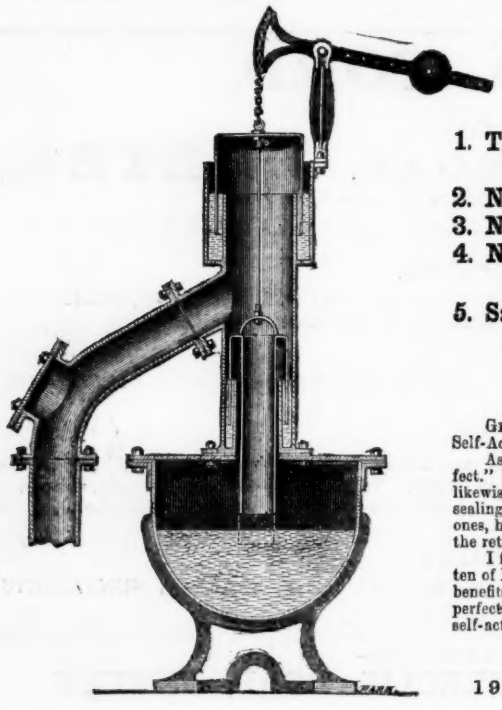

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TESTIMONIAL.

Metropolitan District Asylum, Caterham, Surrey, Dec. 14, 1874.

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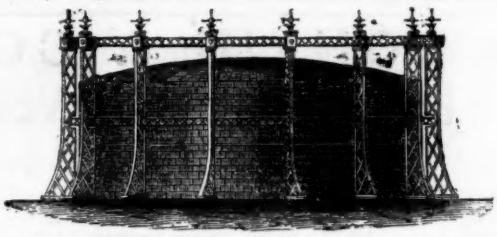

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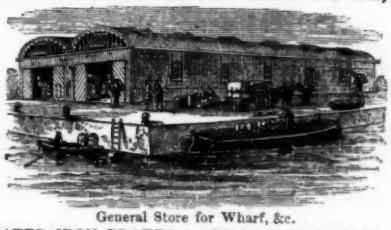
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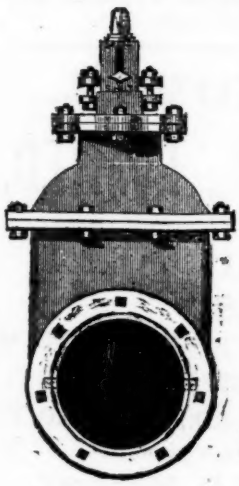

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The front facing is vertical; the back facing forms the wedge.

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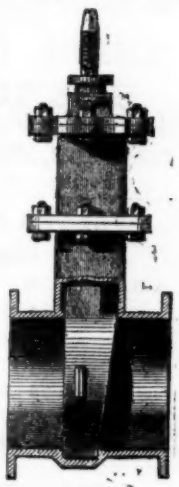

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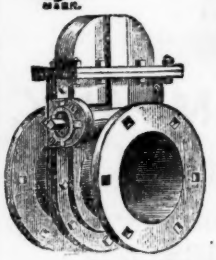
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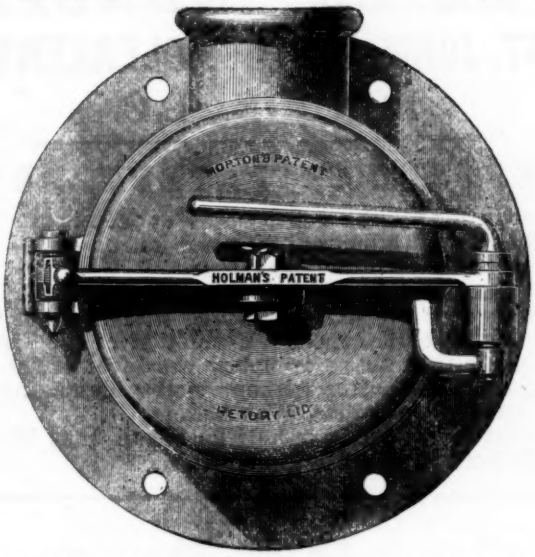

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" Gaslight Co., Silvertown.
" Gaslight Co., Lupus Street.
" London Gaslight Co.
" Independent do.
" Phœnix do.
" South Metropolitan Gaslight Co.
" Commercial do.
" Imperial do.
" West Ham Gas Co.
" Gas-Works, Royal Arsenal, Woolwich.
" do. Barnet.
" do. Lower Sydenham.
" do. Brentford.
" Consumers Gas Co., Woolwich.

The Alliance and Dublin Gas-Works.
" Edinburgh do.
" Manchester Corporation do.
" Salford do. do.
" Rochdale do. do.
" Liverpool Gas-Works.
" Birmingham do.
" Birkenhead do.
" Nottingham do.
" Newcastle-on-Tyne Gas-Works.
" Lurgan do.
" Carmarthen Gas-Works.
" Merthyr Tydfil do.
" Windsor do.
" Leeds do.
" St. Albans do.
" Over Darwen do.
" Rotherham do.
" Aylesbury do.

The Bournemouth Gas-Works.
" Ystrad do.
" Cardiff do.
" Rochester do.
" Keighley do.
" Aberdare do.
" Ballymena do.
" Richmond do.
" Stalybridge do.
" Longton do.
" Exeter do.
" Ross do.
" Falmouth do.
" Barrow-in-Furness do.
" Belfast do.
" Wakefield do.
And other Provincial and Foreign Gas-Works.

IMPORTANT TESTIMONIAL.

The Gaslight and Coke Company (Commonly called the Chartered Gas Company), Beckton, North Woolwich, July 2, 1874.

MESSRS. TANGYE BROTHERS AND HOLMAN.

Gentlemen,—In answer to your inquiry respecting the Self-Sealing Lids, I beg to say that they continue to work well, and I have every reason to be satisfied with them.

I should be very sorry to return to the old system of Luting, and our stokers here freely acknowledge the benefit to them of the new system.

I am, yours truly,
(Signed) G. C. TREWBY.

P.S.—We shall have very shortly about 3000 of your Lids in use.

London 1851. New York, 1853. Paris, 1855. London, 1862.

Dublin, 1865.

The SIX MEDALS AWARDED to THOMAS GLOVER for

PATENT DRY GAS-METERS,

The latter being the Highest Medal awarded for Dry Gas-Meters by the Imperial Commissioners for the Universal Exhibition, Paris, 1867.

Paris, 1867.

THOMAS GLOVER & CO.,

DRY GAS-METER MANUFACTURERS,

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THOMAS GLOVER & CO.'S PATENT DRY GAS-METERS,

1st, Are a remedy for all the defects of Wet Meters;
2nd, Are suitable for all climates, whether hot or cold;
3rd, Incur no loss of Gas by evaporation;
4th, Cannot become fixed by frost, however severe;
5th, Are the most accurate and unvarying measurers of Gas;
6th, Prevent jumping or unexpected extinction of the Lights;
7th, May be fixed either above or below the level of the Lights;
8th, Cannot be tampered with, without visibly damaging the outer case;
9th, Will last much longer than Wet Meters;
10th, Will not cost more than one-half for repair that Wet or Water Meters do;
Are upheld for five years without charge.

WILLIAM PARKINSON & CO.,

(SUCCESSORS TO SAMUEL CROSLEY,)

COTTAGE LANE, CITY ROAD, LONDON, E.C.

Established 1816.

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STREET-LAMP METERS,

AND REGULATORS FOR AVERAGE METER INDICATION.

METERS FOR MEASURING WATER.

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THE JOURNAL OF GAS LIGHTING, WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, MARCH 30, 1875.

Circular to Gas Companies.

The letter of Mr. W. Livesey, on the Public Health Bill, which we published in our last, requires a few words of comment. It is true that the thousand or so of gas companies, who now carry on their business without any stututory authority, might be seriously affected by the operation of the Act, if urban authorities attempted to procure, and succeeded in obtaining, Provisional Orders authorizing them to set up competing gas-works. We do not, however, believe, that many attempts will be made. In the larger cities and boroughs, the absorption of statutory undertakings will probably go on; and in populous and compact districts, such as exist in the North, the local authorities may possibly continue to purchase undertakings. But we regard the bulk of the non-statutory companies as safe from attack. The fact is, that urban authorities will not covet a poor undertaking, and they would have the sense to see that competition with a rich one would be ruinous. It would only, we think, be in cases so purely exceptional, that their occurrence may be considered highly improbable, that the Local Government Board would grant an order authorizing competing works; and should such an order by any chance be granted, there is the opportunity of opposing the Confirmation Bill.

As regards united action, we think something might be done. It is true that the recognition of unauthorized companies, who carry on their operations independently of all public regulations, charging what they will, and supplying what they choose, has been persistently refused. But, according to our experience, the small unauthorized companies carry on their business much in the same way as the "authorized." They supply gas of much the same illuminating power—we say nothing about purity—and, as a rule, accept 10 per cent. as a maximum dividend, fixing the price of gas accordingly. The worst that can be alleged against them is, that they charge to revenue, work that should be done with capital; and this, after all, is no great sin. It is of great advantage to a small proprietary, and, practically, is not detrimental to the interests of consumers, to whom it is of no importance whether they pay for extensions or pay interest on additional capital. It is only in case of a purchase, when the expended profits are necessarily capitalized, that this matter becomes of consequence, or when a special Act or Provisional Order is obtained, and these capitalized profits are allowed a 5 per cent. dividend. In neither case is any one prejudiced.

But while we do not consider that the safety of these unauthorized companies is greatly imperilled by this Bill, we must recommend that some action should be taken. The Gas and Water Companies Association may prepare a form of petition, setting forth the objections to the measure, for presentation to Parliament. We are inclined to think that the Public Health Bill will not be passed this session; but, in any case, many of the companies liable to be injuriously affected by the operation of the Bill, might at once prepare to place themselves under the protection of a special Act or Provisional Order. It will be observed that, while it is proposed to make the Local Government Board the body empowered to grant a Provisional Order to an urban authority, a gas company will still have to apply to the Board of Trade. We may thus possibly witness the curious spectacle of two different bodies, existing within the same limits, applying for Provisional Orders to two different departments of State, with what result it is impossible to foresee. This much, however, we are bound to say. The Local Government Board jealously guard the interests of ratepayers, and we may repeat our belief that, if this Bill should pass, it will only be under altogether exceptional circumstances that the Board will allow the ratepayers money to be expended in competing with a gas company.

The report of the directors of the Chartered Company, to be presented to the half-yearly meeting on Friday, is, like the last, a document of some importance. It very naturally deals with the proceedings of the Corporation of London and Metropolitan Board, in relation to gas affairs, which are unsparingly condemned. It might, however, have been mentioned, that Bill No. 2 (the Purchase Bill) was only withdrawn after the Government had announced that it could not receive their support, and, so far, the Metropolitan Board are relieved of responsibility. They cannot, however, be excused the wanton squandering of money involved in the preparation of Bill No. 1 (competing works), which they well knew would never be carried. When the return asked for by Mr. Sandford, and ordered by the House of Commons, is printed, we shall learn the cost of No. 1 Bill, which will have to be reckoned in thousands of pounds.

The rejection of their own Bill, for non-compliance with Standing Orders, is naturally a sore point with the directors, and we quite agree with them that the opposition of the metropolitan authorities indicated a want of sincerity on the part of the authorities, who probably had no desire at all to purchase. The Regulations Bill then comes in for unmitigated condemnation. Its provisions are very properly stated to be arbitrary and unfair, and it is rightly pointed out that our opponents proposed no "regulations" for themselves. As we have already mentioned, the great contest will be for the revision clauses, inserted, be it understood, in the City of London Act, 1868, *by the framers of the Act themselves*. We have recommended before, an appeal for a higher "standard" price, to prevent the expense of frequent applications to the Board of Trade, but shall be content if the revision clauses be inserted. It is perfectly certain that the leading metropolitan companies can never continue to supply gas at the price proposed by the authorities, and, therefore, if a compact, solemnly ratified by Parliament, is not to be broken, means of advancing the price must be granted.

Attention is very properly drawn, in the report, to the fallacy, so commonly urged, that the cost of coal is unimportant to a gas company, because the price of coke is always commensurate. Every practical man knows that this is not true, and the next half-yearly accounts of the companies will completely dispel the illusion. We have had a long and somewhat severe winter, and coal has been dear. Still the price of coke has been very little above what it was in the days of cheap coal. This has been the case not only with the Chartered Company, whose coke trade is peculiar, but with all the companies, and even those best situated for obtaining the highest price.

The directors announce the sale of the site of Blackfriars works to the Corporation of London, for £170,000, which sum, when received, will be applied in reduction of capital. Some public comments have been made on the apparently low price obtained for the land, and it has been insinuated that the seemingly small sum was accepted to buy off the opposition of the Corporation. We have ourselves called the transaction "a bargain" for the City, but we never supposed that the price was arrived at in any other way than after a fair valuation, made by competent parties on each side. There are one or two other things in this report which we should like to comment upon, but must defer any further remarks until we report the meeting of the shareholders in our next.

The report of the directors of the South Metropolitan Company is also, in some sort, a manifesto against the proceedings of the authorities. The exceptional position of this company gives additional strength to their remonstrances. They protest against being bought up compulsorily for an utterly inadequate price, and have determined to offer strenuous opposition to being placed under more stringent regulations, when they have honestly carried out the stipulations of their Act of 1869. We are pleased to see that the directors recognize the duty of opposition at the present crisis. They must know that time and inevitable additions to capital will, in the course of years, bring them to the level of other companies, and that disturbing influences may, in any year, lead to the sacrifice of their reserve-fund, which now they are able to boast intact. It will be well, therefore, to stand in with the rest for mutual protection against common aggressors.

The report of the directors of the Dublin and Alliance Gas Company will be received by the shareholders with much satisfaction. For the two past years no dividends have been paid, but the pleasing announcement is now made that, out of the profits of the last year, the directors are able to declare a dividend at the rate of 6 per cent. per annum. A small balance remains, a part of which is carried to the credit of the contingent-fund, and £1000 is applied in part payment of the loss made last year. It is gratifying to learn that great progress has been made with the reconstruction of the works, and the overhauling of the mains and services. Although the alterations and repairs are still incomplete, the directors claim that the work already done has operated in producing the present favourable financial results. The progress made is shown by a comparison of the make and sale of gas during the past half year with the corresponding period of the previous year. The quantity of coal carbonized was less by 3739 tons, and the sale of gas per ton was nearly 2000 feet more. The actual make of gas was 9530 feet per ton. Leakage is now reduced to about 19 per cent. With a reduction of price of 2d. per 1000, the rental has increased by over £13,000. But for the depreciated value of the coke, alluded to above, the price of which has averaged only one-half of what it was in the corresponding half of the previous year, the company would have been in a much better position. The results, as they are, however, reflect the greatest credit on all concerned in the direction of the company, and fully justify the opinion we have more than once expressed, that the Alliance Company might be made one of the most prosperous undertakings in the kingdom. In Dublin, as elsewhere, consumers complain of "sudden and mysterious expansions of the registering powers of meters," and grumble because their gas bills for one quarter are not the same as in the corresponding quarter of the previous year. The true explanation is obvious enough, but it is never accepted by the consumer, who cannot be persuaded that he has burned more gas when he has the same number of burners. Unfortunately, gas is rather dear in Dublin at present, and must continue so for some years; but, as the company get into a sound position, the directors will no doubt be able to reduce it below the rate to-day, and a better feeling will be established. The report and accounts will be published with our usual record of the proceedings of the half-yearly meeting, to be held on the 31st inst.

The British Gas Company, it will be seen, have obtained from the committee of the House of Commons pretty well all they asked for by their Bill relating to the Norwich undertaking. The peculiar constitution of the company gave rise to discussions which have no general interest. The company, it seems, have power to raise any amount of money they please, and, therefore, the Bill only prayed for power to *expend* £100,000 on the Norwich undertaking, and to obtain a certain per centage on that amount of capital. This sum has been agreed to; but, following Lord Redesdale, the Commons committee decided that one-fourth of the amount should be raised by way of loan at 5 per cent., and the £80,000 as by shares entitled to 7 per cent. It seems clear that Norwich is very well served by the British Company, but the Corporation are very anxious to get possession of the undertaking.

The Colchester Gas Company have been successful before the committee of the House of Commons; but we were very sorry to hear a threat from Mr. Richards, Q.C., uttered on the part of the Colchester Corporation, that the opposition would be carried to the House of Lords. A very good case was made out for the company. It is clear that they must expend more capital in order to put the works in proper order, and it is certain that they will not be able to raise this capital unless an advanced maximum price for gas be obtained. The committee have granted an additional 9d. in place of the 1s. 2d. asked by the company, with a slightly increased charge for lighting, cleansing, &c., the public lamps; and as regards the charge for gas to public lamps, the committee decided that the Corporation should be placed in the position of the most favoured consumer, other than the Ordnance Department. We sincerely hope that Mr. Richards will counsel no further opposition to this Bill, or that he will recommend the introduction of revision clauses when it comes before the House of Lords.

The return from the Metropolitan Board of Works, asked for by Mr. Sandford, has been limited to the expenses incurred within the last five years, so we shall learn nothing about the cost of the opposition in 1868. Nor, as the order stands, shall we get any information as to the expenditure on the gas Bills this year. It would be well, if possible, to get the order amended, so as to make the return include the sums expended this year.

Water and Sanitary Notes.

The Metropolis Water Supply and Fire Prevention Bill, brought into the House of Commons by Colonel Beresford and others, has been printed. We last year sketched the leading provisions of the measure, but may here give a brief recapitulation. The Bill is intended to transfer the metropolitan water undertakings from the hands of their legitimate owners to a body of commissioners appointed by an Order in Council. The commission may comprise members having experience in public employments or in the Civil Service, and members having experience in connexion with water undertakings. On a certain day the undertakings are to be transferred to the commissioners, whose special duty is then to be—1. To combine, as far as physical conditions will admit, the sources of supply and works of the several companies; 2. To dispose of works, &c., becoming superfluous in consequence of such combination; 3. To continue the supply given by a company, and extend it as may be required; 4. To put the works into a condition to maintain a constant supply at high pressure; 5. To provide and place hydrants and apparatus for high-pressure supply in case of fire, and for other purposes; and 6. To provide and fix apparatus for cleansing and watering the streets, and for other sanitary purposes. The general provisions of the Metropolis Water Act, 1852, are, for the most part, still to apply; but, necessarily, the powers of the Board of Trade are to be abolished. So with regard to the Act of 1871, the powers conferred on the Metropolitan Board of Works by section 10 of the latter Act, are to be transferred to the commission, with the addition that this latter body may, if they think fit, provide fittings for the reception of a constant supply in houses of small value, without requiring payment by owners or occupiers. In like manner they may provide fittings for the supply of groups of houses in courts, &c., gratuitously. The commissioners are to have power to borrow money, and the Public Works Loan Commissioners are to have power to lend to them. The commissioners are, of course, to keep accounts, and apply all the money they receive in paying their expenses and debts, and providing a sinking-fund to pay off borrowed moneys. The consideration for the transfer is the payment of annuities; and it may be worthy of remark that the Bill makes no provision for the appropriation of surplus profits to the redemption of these annuities, which will, therefore, be, in the full acceptation of the word, perpetual. Then comes what may be called the sting of the Bill; these annuities are to be equal in amount to the annual dividend paid, on the average of five complete years before the transfer; special arrangements being made as regards shares more recently issued, and others issued on terms which defer the participation in full dividends. These terms, we may say at once, could not be accepted by the companies; but we need hardly protest, for the Bill is not likely to obtain a second reading. The great objection to the Bill is its completely anomalous character. We might see some reason in the purchase of the undertakings by the State, to be worked, like the Post Office and telegraphs, for the general benefit of the nation; a still greater propriety in their transfer to a municipality, to be carried on for the benefit of the locality; but we see no sense, reason, or propriety in this proposed transference to a body of commissioners, who seem to us, by this Bill, to be left practically irresponsible. One proposal, of some importance, in the last, is omitted in this Bill. It was last year proposed to make the Treasury liable to make up any deficiency in the money required to pay the annuities and working expenses—

a proposition which a Chancellor of the Exchequer would strongly object to.

We need not waste further space on a notice of the Bill, which has not the smallest possible chance of becoming law.

The difficulties Corporations have to contend with in getting rid of their sewage, and the enormous expenses they are put to in dealing with the matter, are forcibly illustrated by the case of Blackburn. The sewage of that town used to be turned into the Blackwater, and thence passed into the Darwen. Sir W. H. Fielden, Bart., brought an action against the Corporation, for polluting this latter stream, and attempted to recover £25,000 damages. He only succeeded, however, in obtaining £1250; but even this small success brought a number of other riparian proprietors down on the Corporation, who were at last compelled to adopt an irrigation scheme. They obtained compulsory powers for the purchase of land for the purpose, and have ever since been engaged with arbitrations. The last case has just been decided by the umpire, Mr. Higgin, Q.C. It concerned 374 acres of land, said to be for the most part stiff clay, and which will, therefore, require the expenditure of a large sum of money to fit it for irrigation purposes. The land, it seems, at present produces £467 a year, and the sum awarded against the Corporation is £44,800, or something like 94 years purchase of its present value. The costs of the arbitrators and umpire amount in this case to £4351, and there are other expenses, amounting to about £15,000, in connexion with it. When the expenses of the drainage necessary to adapt the land for irrigation, and the cost of laying out the ground, are added, the Blackburn sewage farm will turn out to be a very expensive affair, which will probably involve an annual loss to the ratepayers. It is probable that the Corporation will now abandon their intention to purchase the gas and water undertakings, unwilling to incur the responsibility of increasing the debt of the borough to the enormous extent which the acquisition of the undertakings would involve. They may, however, in an evil moment, be persuaded that the profits of these undertakings would make good their inevitable losses on the sewage farm, and be induced to persevere, unless the ratepayers interfere.

A TREATISE ON THE SCIENCE AND PRACTICE OF THE MANUFACTURE AND DISTRIBUTION OF COAL GAS.

LVII.

Gasholders.

When referring to water in excavations, it should have been mentioned that this exists under many varying conditions, such as in localities near a tidal river or sea, where sometimes the work can only be carried on at intervals when the tide is low. However, should the soil be sufficiently compact, the site may be dammed in, and the work continued without interruption; but often, in addition to the damming, pumps may be necessary to keep the ground clear of water. Or, if the work be in the proximity of a non-tidal river or sea, as the Mediterranean (which is practically non-tidal, as it only ebbs and flows the height of a few inches each month), the foundations may be constructed within the water, by the aid of caissons, without any necessity whatever for pumping, of which an instance will be given.

Again, the works may be inland, where ground is very valuable for the object in view, and water being encountered, it must be contended with. An example of this kind of site exists at the South Metropolitan works, where Mr. Livesey is now constructing a new tank. There water was found in abundance at 11 feet below the surface, and in order to carry out the work, for months past it has been constantly pumped at the rate of from 60,000 to 70,000 gallons per hour, or the enormous quantity of 240,000 cubic feet per diem.

In situations like that described, it is usual to sink a wide well in the immediate proximity to the tank, a depth of 2 or 3 feet below the foundation of the intended structure, and in sinking this one or more veins of water may be traversed; or in loose soil the water often arises from the general drainage of the neighbourhood. The well being sunk to the desired depth, and ample means provided for withdrawing the water, as the excavation and construction of the tank proceed, constant communication with the well exists, so that the water flows therein, and is pumped from thence.

The tanks of gasholders, as used in establishments for supplying cities, towns, villages, factories, &c., are usually constructed of cast iron, brick, stone of various kinds, or a combination of two or more of these materials, and in some few instances, within the writer's knowledge, they have been formed of wrought-iron plates, riveted together, and of thickness proportioned to the depth and diameter of the tank. Recently an important step, on economical grounds, has been made in the construction of these vessels, by employing a thin brick lining for their interior, which is backed to the width of its wall by Portland cement concrete. Still more recently gasholder-tanks have been composed entirely of concrete, with unquestionable success in all points with reference to economy, strength, durability, and soundness.

We have already alluded to the difficulties experienced in the early days of gas lighting, in the formation of tanks. These probably arose from the employment of ordinary lime mortar, which, in addition to being slightly soluble by the action of water, was also porous, whilst experience had not then demonstrated the extreme care essential to proper construction. As a remedy for these evils, the use of puddle was resorted to, by placing a layer of plastic clay over the whole area of the intended tank, as well as against the exterior of its wall. The impermeability of this has already been noticed, it can therefore be understood that, by the aid of puddle, and with only the most moderate care, a sound tank must be ensured.

Up to the present time the system of puddling has, regardless of expense, been very generally retained in these structures, and some engineers of eminence still maintain that, for the perfect construction of tanks, puddle is indispensable; but in this opinion we do not share.

There exists also the singular anomaly, in some of the drawings of very large tanks which have been executed, that, although a great thickness of puddle surrounds the wall, the whole of the centre is formed solely of concrete. That the work thus executed may be perfect and sound, there can be no doubt; but it follows that the puddle being dispensed with in the centre, it is not needed around the wall, as, with Portland cement and good well-burned stock bricks, it may be built with the same degree of impermeability as the concrete in the centre. We may assert, therefore, that, with the very excellent building materials at our disposal, puddle is no longer necessary in the formation of gas-tanks, and of this we will hereafter give a striking instance.

There are, moreover, very few localities out of England where plastic clay, suitable for the purpose, is to be met with; for, according to the writer's experience on the Continent and elsewhere, in the construction of tanks, he never yet met with plastic clay in the neighbourhood. It therefore became a work of necessity to construct these vessels without the aid of puddle, and in this he succeeded perfectly.

When deciding on the construction of tanks of brick, masonry, &c., the engineer must be guided by the most suitable and economical material at hand, for different localities have, of course, their peculiar building materials. Thus, in London, and other towns and cities where clay is abundant, brickwork is very generally employed. There are towns in the North where the universal building material consists of stone of various kinds. Again, there are places where, in a manner of speaking, bricks are unknown; for instance, in some of the islands of the Mediterranean sea, where the only material at hand is a soft porous stone. This is used for all kinds of construction, in blocks for walls of buildings, or, sawn into thin slabs, it is used to cover roofing, for flooring, &c.; and, as the joists supporting it are uncovered, it serves as a ceiling to the apartment beneath. In short, this material serves all the purposes of bricks, tiles, slates, and flooring.

In such a locality, and with only this porous stone at his command, the writer contracted, amongst other work, to construct a tank for a specified sum. On his arrival, he ascertained that no bricks were to be had in the island, and, to have incurred the expense of transporting them from the Continent, would have been attended with serious loss. On the other hand, the stone was remarkably cheap, so, after due consideration, it was decided to build the tank, of 56 feet diameter, and 16 feet depth, of this porous stone—a decision that, no doubt, will raise a smile of derision on the countenances of some of our readers. The stone was delivered in blocks of about 3 feet 6 inches long, 18 inches thick, and 12 inches wide, the face being formed to the curvature of the tank. The hydraulic mortar consisted of ordinary lime mortar, with an admixture of "puzzolana"—hereafter mentioned—and, for the backing, large boulders and shingle were procured. With these materials, and good workmen, the tank was commenced. The foundations for the wall were of concrete, about 15 inches thick, but this concrete was continued over the dome in the centre, of about 12 inches in thickness. The first course was then laid, the stones being well wetted and embedded in the mortar. As each course was carried up, it was backed with the boulders, shingle, and hydraulic mortar to the desired thickness, in order to give the necessary strength and to ensure safety. During the progress of the work, the earth was well rammed into the excavation, and the wall, when complete and dry, received two good coats of hot pitch, and, with the dome in the centre, was rendered with hydraulic mortar.

On filling the tank, about a month after its completion, contrary to expectation, it lost considerably during the first few days; but at the end of a fortnight, it was as sound as could be desired. The loss may be explained by the porous stone absorbing the water through some pores which were uncovered by the pitch; but once the pores filled, this action no longer existed, whilst the backing and concrete prevented the water escaping. This tank has now been in operation about fourteen years, and has never shown the least signs of leakage; therefore, with such an example, we may well ask, where is the utility of incurring heavy expenses to procure puddle, when, with ordinary care, it can be dispensed with?—and this with the worst material possible, as, in this instance, the stone was so porous as to be employed for filters.

According to the old-fashioned methods of building tanks, they were made perfectly level over their entire area at base, and sometimes covered with Yorkshire flag paving; by these means expense was incurred without attaining any good object. On the contrary, as the whole area was exposed to the full column of water, the tendency to leakage was increased. It was also frequently stipulated in specifications that the concrete for the foundations of tanks should be thrown from a great height, generally 30 feet, by which means solidity was supposed to be given to the mass; but, as we shall have occasion to observe, when referring further to concrete tanks, the very opposite course should be adopted to secure that object.

The modern practice is to leave a cone or dome in the centre, of such a height that a short pillar placed in its centre will support the king-post of the trussing of the holder when it is down.

The best of all hydraulic cements is unquestionably Portland. This, for rendering or pointing, should be used in its pure state, but for building, it is intermixed with an equal quantity of good clean sand, and sometimes two parts of sand and one of cement are used. One great advantage of this cement is that it sets very slowly, requiring two or three days for that purpose, thus giving the workmen ample time to use it; and for weeks afterwards it increases in strength and hardness. For concrete, six parts of gravel to one of cement is a very suitable mixture. Such is the tenacity of concrete formed of good cement, that it does not yield to the pickaxe; the only way to level it is with the hammer and chisel, when often the stones entering into its composition split before becoming detached from the cement. The remarkable strength of Portland cement was fully established at the International Exhibition of 1851, where some specimens were exhibited, the results of the trial of which were referred to by Mr. Douglas, of Portsea, in his paper on "Concrete Tanks," read before the British Association of Gas Managers last year.

According to Mr. Faija, who recently read a paper at Manchester, on the manufacture and testing of Portland cement, "in colour it should be of a dull bluish grey, and should have a clear, sharp, almost floury feel in the hand; it should weigh from 112 lbs. to 118 lbs. per striked bushel, and, when moulded into a 'briquette,' or small testing-block, and soaked in water for seven days, should be capable of resisting a tensile strain of from 300 lbs. to 400 lbs. per square inch. The cement should, during the process of setting, show neither expansion nor contraction."

With this material, of such extraordinary strength, and the other excellent qualities it possesses, the construction of gasholder-tanks, whether of brick, stone, or concrete, should offer no difficulty, all that is required being care in the manipulation. When we consider that in the deepest gasholder-tank hitherto made the pressure of the water is hardly equal to 30 lbs. on the square inch, and that the cement in question possesses about ten times that force, its vast superiority over all other similar materials is established.

According to our every-day experience, ordinary walls have not often the cohesive force of 1 lb. to the square inch, arising either from the bricks being laid in a dry state, from imperfect workmanship, or bad mortar.

A good and cheap substitute for Portland cement is the material called "puzzolana." This is a dark brown earth obtained from the neighbourhood of Mount Vesuvius, and may be purchased at many ports of the Mediterranean. It is said also to be found in the neighbourhood of Edinburgh. This is reduced to powder, and passed through a moderately fine sieve, the meshes being about the twelfth part of an inch. The powder is then intimately mixed with ordinary lime mortar, in the proportion of two parts of lime to one of puzzolana, and worked in the ordinary way. It sets hard in the course of eight or ten days, and, like Portland cement, increases in hardness for a very considerable time afterwards. The writer had an opportunity of judging of the excellence of this material in the construction of two tanks each of about 90 feet diameter and 30 feet deep, in ground reclaimed from the sea, and the result was satisfactory in the highest degree.

Puzzolana was employed by the celebrated engineer Smeaton in the construction of the Eddystone Lighthouse, prior to the introduction of Portland cement. Since then its importance seems to have been lost sight of in England, as we are not aware of it being employed in any recent structure.

An artificial puzzolana is obtained by reducing burnt clay, patent ballast, or bricks, into powder, which is intermixed with the mortar as described. Hydraulic lime is also produced by introducing a small quantity of clay into the kiln, with the lime, during calcination, being afterwards ground up together. Indeed, cements acquire their hydraulic properties from a portion of argile, or clay, being in combination with the lime, from which they are produced. Blue lias lime, which is often used in the construction of tanks, possesses its hydraulic properties from this cause.

Roman cement, as generally prepared both in England and on the Continent, is quite unsuitable for the construction of tanks, on account of the rapidity with which it sets, so that the workmen have not sufficient time to use it. Frequently, for the purpose of preventing it being wasted, water is intermixed with it just before setting. In this state it is absolutely of less value than common lime mortar.

All bricks used in tanks should be well burned, and, in the act of using, or just previously, they should be well wetted, so that the cement or mortar may combine with them; otherwise, if employed in a dry state, even with the best of cement, there will be no adhesion. Constructing a tank is very different work from building a wall, for in the former each brick must be embedded in the cement or mortar, so filling at the same time the joints contiguous to other bricks. The cement should be well mixed, care being taken to avoid an excess of water; while, to ensure good workmanship, an abundance of material should always be employed.

In some places abroad it is very difficult to get all well-burned bricks, as they are delivered indiscriminately, "place and stock" bricks alike, when, of course, care must be employed to sort them, and employ all the "stocks" on the exterior, and the others in the interior of the wall.

Where rock exists, it may be advantageously employed, for the purpose in question, by squaring it, similar to paving-stones, backing it with rubble to the required thickness, by which means excellent and cheap tanks can be made with it, without, however, going to the extraordinary expense incurred some years ago by an engineer, who had every stone in each course keyed and tongued together, which must have caused an immense amount of labour and expense. The adhesive power of Portland cement being known, such precautions are entirely unnecessary. Moreover, the weight of the material forming the wall, and the pressure of the external earth against it, counteracts, in a great measure, the pressure of the water within the tank. (*To be continued.*)

ERRATUM.—In the 12th line, p. 399, last number, *for* "six inches sectional area" *read* "thirty-six inches."

Communicated Article.

BERLIN MUNICIPAL LIGHTING.

(FROM OUR PARIS CORRESPONDENT.)

According to the annual report recently issued by the Municipal Council of Berlin on the results of the operations of their gas-works from July 1, 1873, to July 1, 1874, the past year's working has been productive of a lower rate of profit than the preceding. This difference is attributed to the higher price that has had to be paid for coal, to an increase in the salaries of the *employés*, and to an augmentation of the capital, necessitated by works of extension.

The total production of gas in the four works of the city during the year was 51,746,400 cubic mètres, or 1,826,647,920 cubic feet, which is an increase over the preceding year of 5,768,400 cubic mètres, or 203,624,520 cubic feet, or 12·546 per cent.

The number of public lights on the 1st of July, 1874, was 9020, showing an increase at the rate of 5·018 per cent. over the preceding year; the number of private lights was 437,950, or an increase of 15·881 per cent.

The total production of gas in the year was as follows:—

	Cubic Mètres.	Cubic Feet.
Public lighting	6,121,027 or	216,072,253
Lighting the works and offices	533,050 ,,	18,816,665
Private lights	39,820,625 ,,	1,405,668,062
Total	46,474,702 ,,	1,640,556,980
Loss by leakage, &c.	5,283,748 ,,	186,516,304
Total consumption	51,758,450 ,,	1,827,073,284
Deduct gas in store on July 1, 1873	12,050 ,,	425,365
Total production in the year	51,746,400 ,,	1,826,647,919

The proportion of gas employed for public lighting was, therefore, 13·171 per cent. of the total quantity supplied; for the works and offices, 1·147 per cent.; and for private lights, 85·682 per cent. The loss of gas during the year was at the rate of 10·208 per cent.

The mean annual consumption of gas by each public burner, estimated at 702 cubic mètres, or 24,780 cubic feet, did not exceed 695·4 cubic mètres, or 24,547 cubic feet, during the year.

The average private consumption during the year was at the rate of 96·692 per cent. The maximum daily production of gas (on Dec. 16) was 264,900 cubic mèters, or 9,350,970 cubic feet; the minimum (on July 3), 56,900 cubic mètres, or 2,008,570 cubic feet. The maximum daily consumption (on Dec. 20) was 274,700 cubic mètres, or 9,696,910 cubic feet; the maximum hourly consumption (on Dec. 20, from 5 p.m. to 6 p.m.) was 31,350 cubic mètres, or 1,106,655 cubic feet, or 11·412 per cent. of the maximum daily consumption. The minimum daily consumption of gas (on July 6) was 53,850 cubic mètres, or 1,900,905 cubic feet. The proportion of the minimum to the maximum daily consumption was as 1 to 5·101, and the proportion of the latter to the annual consumption was as 1 to 188·4.

The quantity of coal carbonized was 188,260 tons, the production of gas per ton being 274·866 cubic mètres, or 9702·77 cubic feet, against 278·41 cubic mètres, or 9727·85 cubic feet in the preceding year. This difference was attributed to inconvenience occasioned by the reconstruction of the old works, and getting the new ones into operation.

Photometrical testings of the illuminating power of the gas, conducted at a distance of about a mile and a quarter from the works, showed almost always identical results—viz., 150 litres (5·3 cubic feet) of gas, consumed in an Argand burner, gave a light equal to from 17 to to 17·75 sperm candles having a flame 1·77 inch in height.

The greatest number of furnaces lighted in the four works was 199, comprising 1398 retorts, and in the course of the twelve months under review, 273,112 retorts were heated, making 1,365,561 charges. The mean quantity of gas produced by each retort per 24 hours was, therefore, 189·5 cubic mètres, or 6689·35 cubic feet, each charge furnishing a mean production of 37·9 cubic mètres, or 1338 cubic feet. In the preceding year these figues were respectively 197·5 and 39·5 cubic mètres, or 6972 and 1394 cubic feet.

These less favourable results arise from causes which have been already explained.

Having given these general statistics of the year's working, we will now proceed to examine the financial results.

WORKING ACCOUNT, *from July* 1, 1873, *to July* 1, 1874.

Expenditure.

		Total for the Year.	Ratio per 1000 Cubic Feet.
Cost of coal		£237,750 12 1	31·24d.
Cost of carbonization		27,459 19 3	3·66
		£265,210 11 4	34·90d.
Less received for—			
Coke	£122,498 6 7		16·15d.
Tar	20,736 7 4		2·73
Ammoniacal liquor	3,895 2 0		0·50
		147,129 15 11	19·38d.
Total cost of coal		£118,080 15 5	15·52d.

Brought forward	£118,080	15	5	..	15·52d.
Cost of purifying materials	874	2	0	..	0·11
Management of works and salaries	26,243	3	9	..	3·40
Total manufacturing expenses	£145,198	1	2	..	19·03d.
Appropriation of land and roads	1,208	3	0	..	0·17
Construction of ovens	8,115	14	5	..	1·08
Maintenance of buildings	4,343	17	0	..	0·58
Ditto of plant	2,385	5	0	..	0·31
Taxes and insurance	5,025	10	3	..	0·68
Accessory manufacturing expenses	9,519	4	6	..	1·27
Management, &c.	11,465	2	6	..	1·53
Pensions (deducting amount received from widows fund)	329	8	4	..	0·04
Expenses of private lighting	4,027	14	9	..	0·54
Ditto of public lighting	7,254	3	3	..	0·98
Doubtful debts	128	6	10	..	0·02
Total expenditure	£199,000	11	0	..	26·23d.
Receipts.					
Amount received for gas, viz.—					
Public lighting	£39,811	11	2	..	5·32d.
Private lighting	311,158	4	6	..	41·25
	£350,969	15	8	..	46·57d.
Deduct expenditure	199,000	11	0	..	26·23
Balance in favour of receipts	£151,969	4	8	..	20·34d.
Amount received for hire of meters	2,995	3	7	..	0·40
	£154,964	8	3	..	20·74d.
Deduct for sinking-fund	48,832	4	10	..	6·40
	£106,132	3	5	..	14·34d.
Deduct interest on capital	44,546	15	4	..	6·00
Net profit for the year	£61,585	8	1	..	8·34d.

To the foregoing account may be added the following particulars:—

The quantity of coke produced during the year was 117,510 tons, exclusive of 3741 tons of ashes, and 7446 tons of breeze. Although a reduction was made in the price of this product, it was found to be very difficult of sale, and, consequently, in April last, the stock had reached 19,843 tons. Of tar there were produced 9491 tons, for which a ready sale was found at a good price. Of ammoniacal liquor the quantity produced was 15,719 tons. The amount realized by the sale of these products of gas manufacture was equal to 50·334 per cent. of the purchase price of the coal. The number of meters out on hire to the consumers was 31,896.

Coke was exclusively employed for the heating of the retorts, and for this purpose 41,305 tons were consumed. The coal used for distillation was obtained principally from Silesia; a small quantity, however, came from the basin of the Rhur. The mean price was about 25s. per ton.

It appears from the figures given respecting the maintenance of the ovens, that each retort produced 84,691 cubic mètres, or about 3 million cubic feet of gas, before requiring renewal.

The cost of lighting and keeping in repair the public lamps, amounted to about 16s. 6d. per lamp per annum; and, as a sum of about £4 12s. per lamp is paid out of the municipal revenues for the gas consumed (estimated at about 25,000 cubic feet in each lamp), the net amount actually received per lamp was £3 15s. 6d., making the cost of the gas about 3s. per 1000 feet.

It is scarcely necessary to reproduce here all the details of the balance-sheet accompanying the report. Suffice it to say that, according to the figures there given, the capital, representing the value of the works, amounts at the present time to £1,402,047 10s., and that the result of the past year's working was the production of a revenue of 11·054 per cent., including interest and sinking-fund, against 13·59 for the year 1872–3.

HANLEY GAS SUPPLY.—At the meeting of the Hanley Town Council on the 23rd inst., the gas examiner reported that during the past month the illuminating power of the gas had averaged 15·22 candles, and sulphur impurities had been present to the extent of 39·73 grains per 100 cubic feet, and ammonia to that of 10·5 grains per 100 cubic feet.

SERIOUS GAS EXPLOSION IN EDINBURGH.—On Monday morning, the 22nd inst., an explosion of gas occurredat 75, Princes Street, which created great alarm, and occasioned the destruction of some property. The accident happened in the office of Messrs. A. Wilson and Son, contractors and terra-cotta manufacturers, which is on the second flat of No. 75. On entering the office at nine o'clock, a clerk named Hamilton perceived a strong smell of gas coming from the back room, and proceeded to explore with a lighted taper for the source of the escape. Mounting a desk in the centre of the room, Hamilton tried the lower branches of the chandelier without effect, but on reaching the joint near the ceiling, there was a sudden explosion, accompanied by a noise as loud as the report of a large piece of artillery, and followed by a crash of wood and glass. The office was nearly wrecked. Maps and plans which hung on the walls were burned or blackened, and the window of the room was blown bodily away, while the wall dividing the room from the staircase was shattered, and large portions of plaster torn off. The door leading to the front office was torn into fragments, and a wooden screen protecting the stair-head door was thrown down. The plate-glass windows of the front room were blown out, and the fragments of glass carried as far as East Princes Street Gardens. The lower panels of the outer door were blown out, and the rush of air also burst outwards all the staircase windows. The window of the room where the explosion occurred looks out to a courtyard, commanded by the back windows of Mr. Stevenson's warehouse, 76, Princes Street, and those of several shops in South Hanover Street. All these back windows were broken. The damage done outside Messrs. Wilson's office is principally to glass. It was curious to note that the glass globes of the chandelier, at the joint of which the explosion occurred, were not broken, nor the glass frames of several small pictures hanging above the mantelpiece, and only a few feet from the gaselier. The clerk Hamilton was scorched about the face, had his hair and whiskers singed off, and his hands severely burned; but the office boy who was on the premises fortunately escaped unhurt. At that hour few people were in Princes Street, and no personal injuries were sustained from the broken glass, which was blown in a thick shower into the thoroughfare.

Parliamentary Intelligence.

HOUSE OF COMMONS.

MONDAY, MARCH 22, 1875.

The British Gas Company (Norwich Station) Bill, as amended, was considered; amendments made; bill to be read the third time.

The Colchester Gas and Pontypridd Water Bills, as amended, were considered; bills to be read the third time.

The Oxford (Corporation) Water Bill, as amended, was considered; clause added and amendment made; bill to be read the third time.

BURGHS AND POPULOUS PLACES GAS SUPPLY (SCOTLAND) BILL.—The order for the second reading of this bill on Tuesday, April 13th, was read and discharged, and the bill withdrawn.

BURGHS AND POPULOUS PLACES (SCOTLAND) GAS SUPPLY (NO. 2) BILL.—This bill was brought in by Sir Wyndham Anstruther, Mr. Orr-Ewing, Mr. Grieve, and Mr. William Holms. Read the first time, and ordered for second reading on Tuesday, April 27th.

BIRMINGHAM AND STAFFORDSHIRE GAS, AND BIRMNIGHAM (CORPORATION) GAS AND WATER BILLS.—The *locus standi* of the following petitioners has been disallowed:—Midland Railway Company; London and North-Western, and Great Western Railway Companies; Owners, lessees, and occupiers of houses, manufactories, and lands, and consumers of gas within the district of Oldbury Local Board of Health, in the county of Worcester; Owners, &c., in Smethwick; Ratepayers and consumers of gas in Tipton; Proprietors of iron-works and large consumers of gas in West Bromwich, against the Birmingham and Staffordshire Gas Bill;—and the Midland Railway Company; The company of proprietors of the Birmingham Canal Navigation; London and North-Western, and Great Western Railway Companies, against the Birmingham (Corporation) Gas and Birmingham (Cor-poration) Water Bills.

METROPOLITAN BOARD OF WORKS (PARLIAMENTARY EXPENSES).—On the motion of Mr. Sandford, returns were ordered from the Metropolitan Board of Works of all sums expended during the last five years, and of all sums expended in promoting and opposing any bills in Parliament, or in complying with the Standing Orders of the Houses of Parliament as to bills introduced, or opposing or supporting bills before committees of Parliament, or as to inquiries before Select Committees of both Houses of Parliament, specifying date of the session, the object promoted, the inquiry before Parliament, the result of such bills promoted or opposed, whether withdrawn or passed.

THE METROPOLITAN BOARD OF WORKS AND THE GAS SUPPLY.

Colonel MAKINS: I beg to ask the Secretary of State for the Home Department if his attention has been drawn to the fact of bills being introduced by the Metropolitan Board of Works, at great cost to the ratepayers, without any statutory authority enabling them to initiate legislation, especially in reference to the gas supply of the metropolis; and whether the Government propose to confer such power upon that body by special Act.

Mr. CROSS: No; the Government have no intention at all to confer such power upon the Metropolitan Board of Works by special Act, but the Metropolitan Board of Works claim to have power under the Metropolis Local Management Act. One of the sections of that Act says that when it appears that further powers are required for the purpose of any works for the improvement of the metropolis, or for the public benefit of the inhabitants, the board shall have power to come to Parliament, and the expense of their application shall be paid, and any further expenses incurred by the board. There is no intention on the part of the Government to give any increase of the powers which the board already have.

TUESDAY, MARCH 23.

The Leicester Water, and Carmarthen Gas Bills were read the third time, and passed.

The Longton Gas, and Truro Water Bills, as amended, were considered; to be read the third time.

On the motion of Sir Charles Forster, the order, "that the East Northumberland Water Bill be committed," was read and discharged. Bill withdrawn.

The Bath Gas, Broadstairs Gas, and Ashton-in-Makerfield Local Board Bills were reported.

Petitions against proposed alteration and additional provision in the Rochdale Improvement Bill were presented from Local Boards of Littleborough, Milnrow, Whitworth, Wuerdle, and Wardle.

The petition of grand jurors and county cesspayers of Waterford, against the Waterford Improvement Bill, was withdrawn.

HOUSE OF COMMONS COMMITTEE.

FRIDAY, MARCH 12.

PONTYPRIDD WATER BILL.

(*Before Admiral* EGERTON, *Mr.* ASSHETON, *Viscount* NEWPORT, *and Mr.* HOPE-JOHNSTONE.)

Serjeant SARGOOD and Mr. MICHAEL appeared for the promoters; the petitioners against the bill were the Troedyrhiw Coal Company, and Mr. William Morgan and the Great Western Colliery Company, for whom Mr. VAUGHAN RICHARDS, Q.C., and Mr. O'HARA appeared.

Mr. MICHAEL opened the case. He said there was virtually no opposition to the preamble, and any discussion which would arise would be more a discussion as to the quantity of water that would be given to the petitioners for compensation. The bill was for the purpose of authorizing the Pontypridd Water Company to make new works, extend their supply, and to raise further capital. The committee would remember that when the Carmarthen Gas Bill was before them it was stated that the Rhondda Valley was one of the most important sources of supply of bituminous coal in South Wales. Pontypridd was in reality in the Taff Valley, which was watered by the river Taff that ran down to Cardiff. The watershed of the country was from two great sources, the one to the westward, running up to Porth, and from there to the greater Rhondda Valley; and that to the east ran due north, to the lesser Rhondda Valley. Both the valleys are funnel-shaped, as was also, to some extent, the valley running down to Cardiff, in consequence of this—a very important element in the district—an immense amount of water was attracted from the watershed by the configuration of the ground. The large amount of 92 inches of water fell upon this district, which realized very nearly what had been stated of some of the districts in Scotland, that "it always rains there, except when it snows." The Pontypridd Water Company in 1864 obtained an Act of Parliament for the purpose of supplying Pontypridd with water. Pontypridd was inhabited by a mining population, and was one of the best sources for the supply of bituminous coal; the whole valley, in fact, was intercepted by seams of coal, and as these properties were taken for the purpose of working, and mines were being sunk from time to time, a very large mining population would be continuously springing up. The population had enormously increased within the last few years, and was still increasing; a proper supply of water was, therefore, one of the first elements of necessity in order to promote and improve the sanitary condition of the people. In truth, the whole of this river, as was not unfrequently the case in many parts of England, was converted into a large open sewer for the drainage of the district; so that the water became totally unfit for use, and the inhabitants were driven for their supply to shallow surface wells which were very much polluted by sewage, and the whole district was absolutely without any water. Having constructed a reservoir under the Act of 1864 at Pontypridd, it was soon found that it was totally inadequate to supply the wants of

the district. In the district from Pontypridd to Porth a large population had accumulated, and there was a great number of people there without any source of supply. Under these circumstances the Pontypridd Water Company had come to Parliament in order to obtain a better and larger source of supply. They sought powers by the bill to acquire ground for a reservoir in a watershed of about 2100 acres. The proposed reservoir would cover three acres of land, and would hold somewhere about 17¼ million gallons of water, which quantity would give a supply of 15 gallons per day per head of a population of 25,000 persons, with a storeage power of from 40 to 50 days. This was very small in proportion to other districts, where there were periods of great drought; but a larger reservoir was unnecessary, seeing the rainfall was continuous during the whole months of the year, and there was no fear of a dry season supervening. The elevation of the site of the reservoir was 1050 feet above the sea level. The water was of the most pure character, and owing to the nature of the soil it was almost free from organic contamination of any kind, and was extremely soft. Generally speaking, when water contained from 15 to 20 grains of solid matter per gallon, it was considered good water, but the water proposed to be stored by the company contained only 3 grains. It was as pure, he thought, as was to be found anywhere, and was admirably suited for all domestic purposes. The promoters, by their scheme, proposed only to take about the twentieth part of the rainfall, or one-third of an inch over the whole drainage area. One of the petitioners had works at a place called Troedyrhiw, where the drainage area was 7250 acres; that multiplied by 80 inches, saved out of 92, would give a quantity during the year of 13,116,000 gallons falling down on the drainage area and coming down the stream. It would be seen, therefore, that the promoters, taking only one-third of an inch of that drainage area, and leaving such an immense quantity of that drainage area untouched, could not do much harm to any of the manufacturers, however great the necessity for water might be. The quantity of water used in that district was extremely small, and there would be no difficulty in arriving at the conclusion that there would not be any injury to any of the petitioners that appeared against the bill. The capital of the original Act of 1864 was £6000, with borrowing powers of £1500. They had expended the whole of their capital, as well as £500 of borrowed money; they therefore had only £1000 left of total capital and borrowing powers. It was proposed by the bill to raise a new capital of £30,000, with £7500 borrowing powers, which money would be required for laying down mains and constructing reservoirs and other necessary works that might arise at some future time; but that portion of the bill was not in any way opposed. The limits of the water supply were simply confined to Pontypridd and the northerly line of the district, in order to meet the demand for the neighbourhood. One of the petitions against the bill was by Mr. Morgan and the Great Western Colliery Company, Limited, who were his lessees. They complained that, if the bill were granted, their supply of water would be greatly diminished. The petitioners got the whole flow from the two valleys of the greater and lesser Rhondda; in fact, they had a drainage area of 24,935 acres, with a waterfall of 80 inches during the year, and he wanted to hear some proof for the assertion that the promoters could injure the petitioners, considering the very small quantity of water required for their works. The bill proposed to take 2000 acres only of the total drainage area of the petitioners; he utterly failed to see how they could be affected more than anybody else in the district, and how the abstraction of such a small quantity of water could by any means prevent them from carrying on their business. The promoters could not take more than was impounded in their reservoir, and all the rest would flow down the stream. The total quantity that could be impounded in the reservoir was the determining element in solving the problem of what amount of water would be taken. The petitioners also contended that adequate provision was not made by the bill for the amount of water abstracted, and that the promoters could have a water supply other than the one proposed. They did not even set up an alternative scheme, and the learned counsel thought that upon that clause they were not entitled to be heard. They also alleged that the plans of the engineers were insufficient, but he should be able to show that the engineering was very simple, and that no difficiency need be apprehended in the engineering or in effectually carrying out the works. The next petition was that of the Troedyrhiw Coal Company, who had been lessees for a long period of years in the parish of Ystradyfodwg, on a farm covering 483 acres, and who had expended considerable sums of money in developing their colliery and in otherwise establishing their trade. They had tanks or water wells supplied from the Rhondda Fawr River, and used the water for the balance-pit system. The train was loaded with as much water as enabled it to bring up a ton of coal; the water was discharged at the bottom of the mine, and there was a water-wheel used in working a pump which pumped the water back into the river. First it was put into the reservoir from the river, and somewhere about a ton and a quarter of water was required each time in order to act as an effectual balance to raise a ton of coal. That was all the water used for the works, and from the immense quantity in the stream it would be shown by the engineers that the supply of the petitioners could not be affected by the small abstraction proposed to be made from the stream. They further alleged that in dry seasons the supply was limited, and altogether failed, but only in one single year was there the slightest approach to any failure in the supply of water, and that was in the year 1868. They also alleged that if power was given to the promoters to abstract water from the supply of the petitioners, the consequence would be that in a dry season they would be deprived of the supply of water which was necessary for the working of their collieries, and they undertook to show that there was no necessity for the powers asked by the company. He would prove, however, that a great public necessity existed. Another clause of the petition alleged that the proposed reservoir being situated in the upper part of the valley which was full of minerals, and which were now being rapidly developed, the withdrawal of the water would injuriously affect many works there as well as their own works. If these important works were to be so affected, why did the owners not appear to complain and to protest against an invasion of their rights? There was no allegation against the preamble, and the only complaint was that the water would be abstracted from the supply to which those works were entitled. He should prove to the committee that although the company was a private one they had promoted the bill in the public interest. He would show how badly the population were supplied with water, and that it was necessary for the growing requirements of the district that there should be a larger supply. It would be for his friends on the opposite side to establish there case, that the bill would do them the injury complained of.

Mr. *Davis*, examined by Mr. MICHAEL.

I am a surgeon, residing in the Rhondda Valley, and a medical officer of the Pontypridd Union. I superintend two districts, and am also medical officer of health. Those districts are under sanitary authority, and I act as the medical officer. The two districts have a population of 17,000 or 18,000. I have been in practice at Porth for 22 years. I attend the men at over 20 collieries. I attend to 12,000 men, besides my private practice. I am well acquainted with the wants of the district and its condition. The population is chiefly working colliers, and is increasing. The present supply of water is from springs, which I do not consider fit for domestic use. The sources of supply are open to pollution, and the quantity is inadequate. The springs are situate on both sides of the mountain. The valley is narrow, with precipitous sides. The sanitary condition of the people is bad, there being no regular system of drainage. I know the site of the proposed reservoir, but have not seen the water. The Ystrad Company supplies water in the greater Rhondda Valley above Llwynpia, but their supply extends three miles beyond that. There is a large population in Porth, chiefly supplied by surface water and springs, which are sometimes dry in summer. Some scheme such as the present is required for the supply of the inhabitants. I have frequently brought the question of deficiency of water supply before the local boards. I think the scheme, as far as I understand it, will be adequate for a proper supply of water.

Cross-examined by Mr. RICHARDS: I know the district very well. The population of the two sanitary districts over which I have control is over 15,000. The districts extend from the Great Western Colliery up to Ferndale. The supply proposed is to 20,000 persons in all. That includes the two medical districts. I am doctor to the Troedyrhiw Collieries at which 250 men are employed. It is situated above Porth upon the Little Rhondda, upon which it is entirely dependent for its supply of water. Any scheme proposed to absorb the water of the Little Rhondda would no doubt to a certain extent deprive the colliery of its water supply. There are periods during the year when the supply of the Little Rhondda is very small. In 1868, I believe, it failed absolutely. During other summers I believe it has been extremely low. I cannot say whether the higher portion of the watershed that supplies the Little Rhondda is the most productive.

Re-examined by Mr. MICHAEL: There is a growing population at Porth, without any supply of water except what I have indicated. The distance between Pontypridd and the site of the proposed reservoir is about 12 miles.

Mr. *George Griffiths*, examined by Mr. MICHAEL.

I reside at Cardiff, and am a coal proprietor in the Rhondda Valley. I have resided until lately all my life at Pontypridd, and am a director of the Pontypridd Water-Works Company. The town of Pontypridd has lately very much increased, owing to the development of minerals in the district. The population is about 20,000, and is continually increasing. The existing reservoir is not competent to supply a sufficient quantity of water. We have expended the whole of the £6000, and have power to borrow £1500, of which we have borrowed £500. The remaining £1000 is not, in my opinion, sufficient to give an effective supply. For the last four or five summers we have been in great straits for a supply of water. The district from Porth to Ferndale would be supplied with water from the proposed reservoir. The land on which it is proposed to be constructed is the property of Mr. Mordecai Jones, who has lately purchased the property, which is full of minerals, which he proposes to work, and it is likely that a large population will accumulate there when the mines are in operation.

Cross-examined by Mr. RICHARDS: There are pits now being sunk. The supply of water obtained by the Troedyrhiw Colliery from the Rhondda Fach is no doubt of great importance to the colliery. I am a proprietor in the Rhondda Fawr Valley. It is impossible to carry on the works of the colliery without water. I am aware that the Troedyrhiw Colliery is worked by a counterbalancing power of water. The up-coming coal is brought up by a descending vessel, containing a large quantity of water, so that the water is absolutely used for the purpose of working the pit. Another colliery was supplied by the Rhondda Fach until lately, but they are now worked by steam-engines. Both were supplied from the Rhondda Valley, but there was not sufficient water. If steam power was applied, the water would be superseded. I do not say who should supply that steam power if the water was taken away. In addition to the balancing described, I understand there is a water-wheel used for pumping the water from the colliery. I am one of the promoters of the bill. The shares are nearly all held by local people, and are a good deal dispersed.

Mr. *Henry Morgan*, examined by Mr. MICHAEL.

I am a mineral surveyor, and have had a great deal of experience in coal working. I am a mineral surveyor to Major Vaughan Lee, who is a very large proprietor of mineral estates in Glamorganshire. I know the Rhondda Valley. I have heard several complaints from the inhabitants of the water being scarce. I have been applied to by the inhabitants to carry pipes from Major Lee's property to Porth, because there was a scarcity of water. Nothing has been done up to the present time to give them this supply.

Cross-examined by Mr. RICHARDS: I know the district well, and the way in which the Troedyrhiw Colliery is worked by water. Working it in that way saves an expense of engine-men, fuel, boilers, and so on. It is very much cheaper, although I cannot tell the rate per ton. I know the position of the Great Western Colliery Company. Mr. Wm. Morgan is owner of the Harfow Fawr estate. He is owner on both sides of the Rhondda Fawr, but I was not aware that the Great Western Company were tenants of his. The Little Rhondda brings a great deal of water to the Great Rhondda. At all events, it helps it, so that if water were taken from the Rhondda Fach, it would lessen the quantity in the Rhondda Fawr. There would be, no doubt, some of it taken, but in a larger watershed there would be a large supply after the water from the small river had been taken away, but this would no doubt depend upon the dryness of the season.

Re-examined by Mr. MICHAEL: There are several streams on both sides of the valley, coming down to Pontypridd. The dimensions of the reservoir supplying the Great Western Coal Company are 138 feet by an average of 31 feet; with a depth of 3 feet 6 inches. The water is got from the side of the hill, and not from the river at all.

Mr. *Alexander Bassett*, examined by Mr. MICHAEL.

I am a civil engineer practising at Cardiff, and a member of the Institution of Civil Engineers. I was acquainted with the Glamorganshire district previous to 1850. I was asked in December, 1861, to report on the cost of supplying the town of Pontypridd with water. The existing reservoir was constructed in 1862 and 1863 by a limited company. The public, I believe, were first supplied with water in the early part of 1863. The cost of the reservoir and the laying of the pipes at that time was £3250. There has been some money expended since. I believe the whole of the capital has been expended. The company then came to Parliament, and obtained an Act in 1864. The present reservoir will hold about 2,250,000 gallons, and the elevation is about 240 feet above the town of Pontypridd, and there is not sufficient elevation to supply the whole of the houses in the Rhondda Valley. The site of the new reservoir is about 800 feet above the town of Pontypridd, and would be about 660 feet above the existing reservoir. For some years past the scarcity of water has been very much felt in the district. Springs containing water of a hard nature have been turned into the water at present, when there is a deficiency of the supply from the river. In the autumn of last year I was employed by the directors to report upon the water supply of the district. I examined the entire district from Pontypridd beyond Ferndale, and had the advice and assistance of the resident owners of property. I endeavoured to choose such a site for the proposed reservoir as would not interfere with the mineral workings. I was told by Mr. Davis, a very large owner of property at Ferndale, that if we supplied that district from a reservoir at a high level, he would take a very large interest in the scheme; and he named a sum of money he would take as compensation. He has had a large number of houses built, and no doubt will build many more, because he is sinking two additional pits. Mr. Mordecai Jones's pits are also being developed. I met him on the place, and owing to a suggestion he made to me I altered the position of the reservoir from that which I originally proposed. He seemed most anxious that the reservoir should be constructed at such a height that it would supply the whole of the houses he had built, and stated that if the company did not give a supply he would be obliged to get a supply by some means or other. There is no other supply except this river. I inspected the whole of the district and the various tributaries flowing into the river, and there is no tributary that can be depended upon except this river. None of the other tributaries would be sufficient to give us the quantity of water in the summer time. The extent of the watershed we propose to take is about 2160 acres. The sides of the valley are very precipitous, and consequently the absorption of water would be reduced to a minimum. The water would flow very rapidly into the reservoir. I have carefully examined the returns for the last five years of the rainfall in this district, and the water is very abundant.

The lowest rainfall occurred in the month of May, 1871, when it was 76·1 inches, which would give 25 million gallons over that area. The average rainfall of that year was 92 inches. Owing to the precipitous character of this ground we should get a greater quantity of actual rainfall available for storeage purposes. The capacity of the proposed reservoir is 15,500,000 gallons, which, with the existing reservoir, would give a total of 17,750,000 gallons. The area would be about 3 acres. The embankment would be made in the ordinary mode—viz., puddle bank. The sides will be at an inclination of 3 to 1, and care will be taken to sink the puddle banks to such a depth, not only at the bottom, but at the sides, as to make the reservoir completely watertight. There will be no engineering difficulties in carrying out the works. The total height is 40 feet above the level of the river. The rain water level would be 5 feet below the top of the bank. There are about 20,000 inhabitants within the area at the present time. Taking a population of 25,000 inhabitants, with 15 gallons per head, it will give 375,000 gallons per day, which will work out to some 47 days supply. The water supply is usually taken at 60 days; therefore we are providing a smaller quantity of storeage than would be necessary under ordinary circumstances. Taking the last five years, the rainfall has never been less in one month than 25 million gallons. Of the total rainfall we have to impound 1-20th. The watershed of the area from the proposed reservoir to Porth is 5286 acres, of which we propose to take only 2000 acres.

Mr. MICHAEL: Are there streams running into the river in all directions in those portions of the drainage area that you do not propose to take?

Witness: Yes; there is a very large stream above Porth, where we thought of placing the reservoir at one time, but, at the request of the owners in the district, we abandoned that scheme. All the springs there are independent of the rainfall in this drainage area. There are springs all the way up the valley. From a number of the pits a very large quantity of water will be pumped, and as the other pits are sunk a much larger proportion will be discharged into the river than has been hitherto. There are two very important springs below the proposed reservoir which we do not propose to take. The expense of the construction of the work, I anticipate, will be £24,000. That includes the construction of the reservoir, the by-wash of the tunnel, and all the pipes of the reservoir down to join our pipes at Pontypridd. We take easements from Mr. Mordecai Jones's property; that leaves us £6000 of capital for extension, besides the borrowing powers. We go through no property except Mr. Jones's. When the full supply is obtained at the works, I calculate that the return on the capital expended will be something like 7½ per cent. nett income. I have considered the way in which the interests of the two petitioners would be affected by the abstraction of the water. I think it would be a rare thing if the works of the Troedyrhiw Colliery were ever stopped from want of water. I do not know what quantity they use, but I know they have a balance-pit, which is the old-fashioned mode of working. When the pits were sunk they would be discharging water during the dry season all the year round, which would all go to the works that were below them. I think that will be sufficient to compensate for any water we may take. The water will come down even in the dry season, and abstraction of it would affect the pumping very little.

Cross-examined by Mr. RICHARDS: I do not know what quantity the Troedyrhiw Company use. I think they always depend upon a regular supply of water from the river. If the river was run dry, perhaps they would have some difficulty in obtaining a supply. If we took the whole of the small Rhondda River, they would undoubtedly have a very little water; but I think the small quantity we take, compared with the watershed, will not affect them much. The Lesser Rhondda might have been dry in 1868 for a few days, but in the dry month there is more than the average supply of water to be found in other streams. In June, 1870, the rainfall at Treherbert was 1·107 inch, and in the following July 3·6 inch. In May, 1871, which was the lowest month in the whole of the five years, the rainfall was ·676, and in the following month it was 3 inches. In 1872 the total rainfall was 126 inches. In the lowest year, 1870, it was 72 inches. I believe the rainfall at Cardiff is about 40, which, no doubt, would make it appear that the rainfall was higher as you went up the valley. The present reservoir supplies about 550 houses. The works made in 1864 are only fit to supply Pontypridd, and the small district round it. We propose now to supply a portion of the parish of Ystradyfodwg.

Mr. RICHARDS: There is no word mentioned of compensation in the bill.

Witness: I do not think it necessary. In making out these works, and calculating the capital necessary, I never made any allowance for compensation. I know the position of the Troedyrhiw Colliery and the way in which it is worked, but I have never been underground.

Mr. RICHARDS: It never occurred to you that if you took this large supply of water from them that it would affect them?

Witness: I did not consider we were in the slightest degree affecting them. I never heard of them being stopped from want of water. I never heard any complaint. The interest the company pays is 6 per cent., and there is a profit of 7½ per cent. I do not think it will be a bad speculation. I should be very sorry to injure the Troedyrhiw people in any way, but I am under the impression that we shall not injure them. I should have thought it the most absurd thing in the world to have suggested that the company should take the water supply from near the Aberdare Junction, because there is a high mountain between it and Porth, and they would have to force the water unnaturally. It would be a piece of bad engineering. I allow 15 gallons per head, which is practically more than will be required. 20 gallons is the usual quantity, but in this case we know 15 gallons per head is not taken by the people in this district.

Mr. RICHARDS: When Pontypridd gets civilized, do you not think that 15 gallons per head is a small allowance, if it includes the supply to the water-closets?

Witness: Some time ago the consumption did not reach more than 8 or 9 gallons per head.

Serjeant SARGOOD: When Pontypridd gets more civilized as my friend expresses it, there will no doubt be a proper system of drainage provided. At present, I believe, there is not a water-closet system?

Witness: No.

By the COMMITTEE: The existing reservoir is supplied by a series of springs on the property of Lord Tredegar. Some of these springs are very good indeed, but some of them contain very hard water.

Mr. *Alfred Williams*, examined by Sergeant SARGOOD,

I am a member of the Institution of Civil Engineers, in practice in Great George Street, and am a very old practitioner. I have for some 25 years past acquainted myself with this locality, and know the neighbourhood generally. In 1863 my attention was turned especially to the question of the water supply there. I visited the district on behalf of a scheme then proposed for getting a better supply for the town of Pontypridd, which at that time was insufficient. I took gaugings at that time of the water running into the Pontypridd reservoir on the 7th and the 17th of March. The quantity varied very much. The lower gauging on the 7th of March was 77,805 gallons per day, and on the 17th, 107,995 gallons. It all depends upon the rainfall, which appears to be wonderful in that district. I also visited the site of the proposed reservoir, and the land through which it is proposed the pipes should pass for the purpose of this bill. The country where the reservoir is proposed to be erected is open mountain land, without any cultivated or enclosed land for building of any kind. The sheep graze on it. It is dry mountain pasture generally, although some parts are boggy and some parts rocky. I observed that soon after a wet night the water was very clear. I drank some of it, and thought it would be a good thing if we had such water in London. The proposed works will supply the very populous valley of Little Rhondda. It might be possible to supply the valley from any other source, but not very practicable. We do not like to go far up valleys of that kind. I have examined the character of the works that are suggested to be erected, and they are remarkably simple.

Cross-examined by Mr. RICHARDS: I think there will be no fear of the water percolating from the proposed reservoir to any of the collieries below.

Mr. RICHARDS: I suppose there will no difficulty whatever in making such reservoirs as will be sufficient to give compensation to anybody whom the works will deprive of the water?

Witness: There will be no difficulty in making larger reservoirs, if they are necessary, although it will cost more, no doubt.

Mr. RICHARDS: And would it not interfere with the 7½ per cent of the possible profits?

Witness: Of course, to some extent it might. I would not have made any provision for compensation, as any possible damage is so exceedingly remote.

Serjeant SARGOOD: If you had to abandon your present reservoir, and a large portion were left without a contingent supply of water, you would only increase your difficulty by cutting further into the coal district.

Witness: I think so.

Serjeant SARGOOD: If my friend suggests larger reservoirs, that means greater dangers than he apprehends?

Witness: That would be so. Of the rainfall here we should only take 3 inches out of 90 for a supply of 20,000 people, exclusive of springs.

Mr. *Richard Bedlington*, examined by Mr. MICHAEL.

I am a mining engineer, residing at Aberdare, and am acquainted with the locality described. I represent Mr. Davis, who is a member of a firm who have a colliery at Ferndale. Mr. Davis is unable to be present just now, owing to ill health, but I have his authority to represent his concurrence in this bill, and to say that he intends to be a shareholder in the company. He considers he will be in no way injured by the construction of these works. [The witness generally corroborated the evidence of previous witnesses as to the necessity there was for a further supply of water.] He also stated that there were a number of pits already sunk, and others in the course of being sunk along the line of the Rhondda. There were 20 separate collieries from the Meardy down to Pontypridd, and the houses connected with them would be supplied by the proposed scheme. The distance from the proposed reservoir to the Troedyrhiw Colliery was about 7 or 8 miles. There were only two of the 20 collieries opposing the bill. He had had the management only of the steam coal pits throughout that valley at Ferndale, and it was a lamentable thing that, although the pits were about 300 yards deep, they had only to pump to the depth of 60 or 70 yards. He thought that the proposed supply would suffice for a population of 25,000. The present population was only 17,000.

Cross-examined by Mr. RICHARDS: There are 10 winding pits between Porth and the reservoir, five of which are actually sunk, and five in process of being sunk. I think all these collieries are worked by steam except the Troedyrhiw Colliery, which was not the only one dependent upon water. Some of the collieries require water for the boilers, which they can, no doubt, acquire from the water company; but they pump water from their pits, and might supply themselves. It seems to me, from the number of pits that are being sunk in the valley, that the quantity of water running into the Rhondda Fawr Valley will be more than hitherto in the dry season; inasmuch as all these pits will be pumped into the river.

Mr. RICHARDS: Then you think that the Troedyrhiw people are to depend upon others for their water?

Witness: They will be obliged to pump up, and the supply will be more regular. The principal streams are below the proposed watershed. The reason the supply of water to the Troedyrhiw Colliery has been so deficient in the dry season is that they have not had sufficient pits pumping above them.

By the COMMITTEE: I think 200 tons a day would be discharged into the river from each of these pits, but it is very difficult to estimate. I am certain of this—that, owing to the sinking of these various pits, the Troedyrhiw Colliery will be far better off for water than they formerly were. It is likely to be a continuous supply, and the tendency will be to increase.

This concluded the case for the promoters.

Mr. RICHARDS then addressed the committee on behalf of the Troedyrhiw Colliery. He said that the colliery did not appear to oppose what might be put forward as an important undertaking, for the benefit of the people living in the neighbourhood of Pontypridd, except so far as it was calculated not only to interfere with, but to absolutely destroy, the means the colliery had of carrying on their trade. The colliery, which was situated upon the line of the lesser Rhondda, had used the waters of the stream for the purposes of raising coal by the balance system, and also for the purpose of driving a water-wheel which was used for pumping up the water from the pit. It had been said that if the coal company placed the water in a reservoir, and kept it there, and let it out in proportion to their requirements as they arose, that they would have plenty of water. That might be so, but hitherto the company had had the uninterrupted use of the water, and they maintained that the promoters, as traders asking to impound the water and to sell it at a profit of 7½ per cent. upon their capital, were bound first of all to show that there was an absolute necessity for asking for an increased supply. Besides, they could get water from anywhere else, and if they did not they were bound to put the petitioners in such a position as they had found them, but they proposed to do nothing of the sort. They proposed to deprive the petitioners of the water by which their pit was worked. It was, no doubt, true that at certain periods a large quantity of water flowed past the works which was not used or impounded by the petitioners, but there were periods when the flow of water was extremely small, and at these periods the promoters would absorb the whole of it. In 1868 the works were entirely stopped from the deficiency of the supply of water. That was not commonly the case, but it occurred in an unusually dry summer. The small flow of water was common to every dry season, and just at the time the water was most important to the carrying on of the petitioners business the promoters would step in and absorb the whole of the water in the Rhondda Fawr. There was not a proposition of anything like compensation in the bill. The promoters had said that the petitioners were the only colliery out of all these collieries that made complaint; but it turned out upon enquiry that they were the only people whose colliery was in truth dependent upon this water supply. Other people could get water from the company, but the Troedyrhiw Colliery were absolutely dependent upon the flow of water from the stream in question. He did not think that there was ever a case of greater hardship upon a colliery than there would be if the proposal of the promoters were entertained. The petitioners had not suggested any alternative scheme, but they had intimated that there were other sources of supply that might be drawn upon. So far as he understood the evidence, the Clydach, a tributary of the Taff, would give a supply to a certain portion of the Rhondda Valley. No doubt levels would not enable them to go so far as Ferndale, but he wished to know if the Troedyrhiw Colliery were to be sacrificed to the interests of Mr. Davis, of Ferndale, who was working the colliery there. No doubt the population there was increasing; but, at the same time, Mr. Davis would have an opportunity of getting water elsewhere than from the Pontypridd Company, who, no doubt, saw a very good stroke of business in supplying the Ferndale Colliery. When the company came to sell their water, they were bound to consider that the petitioners had had the use of the water up to the present time. That was really his case, and he should prove to the committee, by evidence, the way in which the water was used. Be the quantity large or small, he maintained that the promoters had no right to come and absolutely prejudice the trade of the commissioners by taking the water. It had been said that the rainfall was enormous, but that was only at certain periods of the year. No doubt in a rainy

season a large quantity of water passed by that was not utilized. He could only say that to construct compensation reservoirs for the benefit of those who had hitherto had the water was a mere question of money. The promoters had no right to come and take the water which was the very life and soul of the petitioners colliery.

Mr. *Thomas Foster Brown*, examined by Mr. RICHARDS,

I am a civil and mining engineer at Cardiff. I act for many large mineral owners and colliery proprietors. I am acquainted with Pontypridd and the different towns and villages in the district. I know the Troedyrhiw Colliery's works at Porth. I am well acquainted with the coal-field, and my firm are agents for one of the lessors. Their particular coal-field is upon 500 acres, of which there are only worked about 320 acres. Their works are likely to be increased as time goes on. The site of the pit is near the junction of the little Rhondda River with the big Rhondda River, and at such a point in the valley as enabled the proprietors, when they established the colliery, to calculate upon a permanent and regular supply of water. That being so, they adopted a mode of working which involved the consumption of a large proportion of water, which was attended with a very great economy in working, I should think to the extent of 6d. per ton of the quantity they worked; that arises in the saving of labour, fuel, &c. The amount expended for the purpose of applying the water power was somewhat less than the expense of steam power of a similar character would be. The average raisings of coal throughout the year are from 40,000 to 45,000 tons, and that allows for stoppages, strikes, and so on. The daily quantity is 200 tons when they are working. The probable consumption of water in raising the coal by balancing is only about 60 gallons per minute, but besides there is a large 20 feet water-wheel, by which they work two sets of 12-inch pumps for the bottom of this pit, by means of which they raise the water that has fallen down from the balance, and the total quantity raised from the pit is about 200 gallons per minute from a depth of 92 yards. The amount of water required to use that, after allowing for the loss of per centage in the overshot-wheel, will be found to come to 30,000 tons per day. The nearest existing pits would only produce about 200 tons per day, and we require 30,000. There would be a certain quantity of water, but it would bear such a small proportion to our requirements that it is really not worth mentioning.

Mr. RICHARDS: What do you consider the water supply to the Troedyrhiw Company worth per annum as compared with working by steam?

Witness: I should think, to establish equal steam-power, £1200 or £1500 a year upon the quantity of coal. My figures do not agree with the figures of Mr. Bassett as to the rainfalls. I agree with him as to the watershed they have, but the watershed of the north part is carried to the point below which we can get the water from the river, and my area also of the portion is 4570 as against 5000 acres; but the discrepancy is by continuing the area below the point where we can get the water. The average rainfall at Treherbert was 92 inches, which is the rainfall, I understand, that has been adopted; but it is quite clear that below, on the south, the rainfall is less, because the mountains and the general elevation are not so high, and, as a proof, in Cardiff it is very much less. But not only that, in Aberdare, which goes eastward, although it is somewhat lower than the district farther north, there is something like 25 per cent. less than at Treherbert. Taking the lower area at 25 per cent. less, the proportion of the area proposed to be turned into this new reservoir, as compared with the total watershed which is available for the Troedyrhiw Coal Company, is something like 2-5ths. In 1868, during the dry season, the Troedyrhiw Company for a time had to adopt temporary means for working their machinery, independent of the river. As regards the consumers in the years 1870-71, they had barely sufficient for their requirements.

Mr. RICHARDS: In short, in dry seasons they require, under ordinary circumstances, all the water of the rainfall?

Witness: Undoubtedly; I believe they could do with something more.

Mr. RICHARDS: Of course the cessation of water means that some other mode must be taken for pumping?

Witness: Of course the water would accumulate, and the pit would be flooded. In May and June, 1871, the rainfall at Treherbert was somewhat under 4 inches. Adopting my calculation as to the proportion of the area of watershed, that would give us somewhat less than we should require during those months; and I believe that is borne out by the practical result, because the manager told me they were short of water during those two summers. A provision for compensation water is a very usual thing in a water bill. It is usual, I understand, to provide storeage, not only for the population to be supplied, but for millowners and others who have been using the water.

Mr. RICHARDS: And it is only a matter of pounds, shillings, and pence, whether that compensation is made, or not?

Witness: I think it should be made in the shape of water. The reservoir is totally inadequate.

Mr. MICHAEL: Do you know the general law is, that if any injury is to be done by the abstraction of water, it is to be paid for?

Witness: Yes; but I said it should be made in water. Supposing the demand for water should increase, that will not do for five years hence.

Mr. MICHAEL: Are you not limited to your power of use by the quantity of water which you have got to use?

Witness: Of course we cannot use any more water than we have in the river.

Mr. MICHAEL: Supposing you had an unlimited quantity of water there, what is the quantity you can take by this pit—by this balance system—what is the average of coal you could raise by the use of this balance pit system?

Witness: We produce about 200 tons a day; I should not like to say we could produce more.

Mr. MICHAEL: Irrespective of expense, are there any advantages attached to the balancing system?

Witness: It may involve expense, but I will tell you a case where it is useful. The men have been out a long time in South Wales, but that colliery is worked without any expense whatever. The pumping is going on without any labour except a man that looks after the wheel. It is not my experience that one man could mind a steam-engine; you would require three or four; you would want a stoker in the first place, and you have to work day and night. The pumps go to the depth of 92 yards, and they are 12 inches in diameter. There are two engines pumping and one winding, and there are seven men altogether to pump and wind. We have to lift 200 gallons a minute for 24 hours. We take about 25 per cent. down with the balancing machinery; that is, 12,000 gallons an hour, working day and night, making a total quantity of 288,000. I make out that we use for the balancing engine 360 tons of water a day; but there are the men to raise, and the rubbish to raise. 360 tons is about 80,000 gallons; that, subtracted from the total quantity we have to lift, would leave 208,000, which is the quantity of drainage into the pit. There are four pits working at the present time between Porth and the site of the proposed reservoir. We require 360 tons per day; that is, 6,720,000 gallons per day.

By Mr. RICHARDS: In the dry season we cannot get any water. The average quantity of coal raised is 200 tons.

By the COMMITTEE: The only compensation would be a sufficient storeage to keep us supplied with water. I think the present reservoir is totally inadequate for such compensation, and that it ought to be enlarged. I believe, when the water supply failed in 1868, there was the temporary assistance of a steam-engine for two or three weeks.

Mr. RICHARDS then addressed the committee on behalf of Mr. Morgan and the Great Western Colliery Company, whose case was similar to that of the other petitioners.

Mr. *Thomas Harrison*, examined by Mr. RICHARDS,

I live at Pontypridd, and am manager to the Great Western Colliery Company, held under Mr. Morgan at Hafod. He is an owner on both banks of the bigger Rhondda, the colliery lessees being situate on one bank. I am well acquainted with the district. We do not take anything at present from the Rhondda Fawr. We are enlarging our colliery to the extent of raising two additional thousand tons a day. We raise at present 300 tons, and we shall require, to do what we propose, the water from the Rhondda Fawr. We have at the present moment a pipe to collect the water to our siding, the state of our business at present not requiring us to take the water from the river. We have never yet taken any from the river, but when the works are completed we shall have to do so.

Mr. RICHARDS: If you do not take it from the river you will have to increase your reservoir?

Witness: Yes; we shall have to make it much larger. The capacity of the reservoir is 142 feet by 38 feet by 4 feet, which is large enough for present purposes. When we have completed our present works we shall require from the Rhondda about 10,000 gallons in 24 hours. In dry seasons, as far as my experience has gone, I cannot say whether we shall get it; the abstraction from the little Rhondda will lessen the volume of the bigger Rhondda. When the company take the supply of water from the river, they ought to supply us from their main. If they provide us with the means of increasing our reservoir that will answer our purpose. As far as I know, they offer us no compensation whatever.

This concluded the case for the petioners.

Mr. MICHAEL, in addressing the committee on behalf of the promoters, said that the matter was left in precisely the same position as it was when he opened his case. There had not been one single word said against the preamble of the bill, which was a proof definitively of an extraordinary bad state of things, and showed a sanitary condition which was really a disgrace to the neighbourhood, great injury being inflicted from the want of water, which was one of the first elements of life. The only opposition on the part of the petitioners, was that the promoters ought to have provided for water compensation in the bill. Assuming they were correct, it was simply a contention as to a clause to protect their interests. He would deal with the evidence of the last witness first. The Great Western Colliery Company, it seemed, were sinking for coal, which they had not yet reached, and were using water which they did not take from the river at all. The whole of their needs were supplied without the use of the water proposed to be extracted from the river, the Great Western Company being contented at the present moment with a reservoir supplied by springs, which was entirely unconnected with the stream. If at any future time the promoters infringed upon the supply of the colliery company the general law would give them damages. The colliery works were below these two great streams, with 14,000 acres of watershed, and they would require 10,000 gallons a day; and yet, with this enormous quantity of water coming down the streams, they ventured to say that they should have some clause in the bill to increase the reservoir which was their present source of supply. He would therefore dismiss that case. As to the other witness, Mr. Brown, he never heard a witness who so entirely destroyed the case he had come to support. Supposing the promoters were to do any damage by the proposed abstraction of water, the general law provided compensation. He ventured to hope that Mr. Brown unthinkingly considered that if the promoters abstracted water there was no money compensation that would meet the case. He had admitted that during the days the colliery was stopped in 1868 they were able, with a small portable engine, to carry on their works, and yet he said there was absolutely no money compensation that would meet the case. The total quantity of water required every day, in order to carry on this undertaking, was 6,720,000 gallons per day. It was proposed by the bill to abstract about 320,000 gallons. Now, supposing that 320,000 gallons were abstracted, 6,400,000 gallons would be left running down the stream, and the petitioners alleged that, by the abstracting of one-twentieth of their daily supply, their works would be damaged. Another calculation of his (the learned counsel's) destroyed Mr. Brown's evidence. He had followed him out in the total quantity of drainage water that was pumped out of the colliery, which amounted to 200,000 gallons, and the witness said that was not exceptional. There were four pits worked by one source of supply. The 200,000 multiplied would give 800,000 gallons of water poured into the stream, as against the 370,000 that were to be taken away; and, for every pit that was sunk, half the quantity abstracted by the promoters would be supplied. The pits in the dry season would from necessity be pumping out 200,000 gallons each. Under these circumstances, he should like to know how there was to be any damage? Supposing there was, then the general law would provide that the petitioners should be compensated. The whole question was reduced into one of mere money value. It had been shown that the water was not essential to the carrying out of the petitioners works, because, if the whole of the water the proposed reservoir would contain was abstracted, it would only be a twentieth part of their supply, and there would be no appreciable damage to the works. Through the inquiry, the preamble of the bill had been untouched; and that being so, it was for the committee to say whether, or not, they would accord to the inhabitants of Pontypridd the supply of water which they required for the district.

The room was then cleared, and the committee consulted for a few minutes.

On the readmission of the parties, the CHAIRMAN intimated that the committee considered that the preamble of the bill was proved.

Mr. MICHAEL said that there was a clause for the protection of Mr. Jones which would be considered by Monday morning.

Mr. RICHARDS said that, under the present circumstances, the opposition would retire.

MONDAY, MARCH 51.

BRITISH GASLIGHT COMPANY (NORWICH STATION) BILL.

(*Before Mr.* JULIAN GOLDSMID, *Chairman; Lord* RENDLESHAM, *Mr.* E. STANHOPE, *and Mr.* G. ELLIOTT.)

(*Continued from page* 411.)

Mr. MICHAEL read the clause which he proposed should stand as clause 9 of the bill, relating to the provision for limiting the dividend to be paid, and said he believed that it met the intention of the committee, and he need not make any further remark upon it; it was the kind of clause universally inserted in bills of such a character as the present bill. The clause was as follows:—"Notwithstanding anything in the Act of 1858 contained, the company may expend for the purposes of this Act, the sum of £100,000, in addition to the said sum of £100,000 already expended under the powers of the Act of 1858. Provided always that of the said sum of £100,000 by this Act authorized to be further expended, the sum of £80,000 shall be expended out of the capital stock of the company, and the company may, from time to time, borrow on mortgage, in respect of some further capital so authorized, sums not exceeding in the whole the sum of £20,000. Provided further that the profit to be divided by the company, in respect of so much of the additional capital of £80,000 as may from time to time be actually expended shall not exceed £7 per cent. per annum in respect of so much thereof as shall be issued as ordinary capital, and £6 per cent. per annum in respect of so much thereof as shall be issued as preference capital."

Serjeant SARGOOD observed that his friend's concluding words threw light on the whole subject. This bill was quite different to all other bills of that kind; and it would have been better if his learned friend had taken the trouble to get at the mind and spirit of the committee a little more than he had done. Recognizing the £100,000, the amendment the company proposed was this, that they should spend £80,000 out of their capital, so that instead of getting a rateable reduction of interest upon each £100 as it was spent, the corporation could not obtain it until the £80,000 was spent. Then, as regarded the remainder, the company asked power to borrow; but that they did not require; they had that power now. What he believed to be the spirit of the committee's desire

and intention was this—that they were desirous, so far as they had the power of affecting the bye-laws, to put the company into the position which was occupied ordinarily by companies who came before them; and though they could not do it by a direct statute, they had the means of saying how it was to be worked out. The whole capital of the company might be said to consist of four-fifths of share capital, and one-fifth of borrowed money. That being the ordinary position of a company, how was the present company to be put into that position? It could not be done theoretically or practically by talking about share and borrowed capital, because such things only existed in idea; under the bill there was no such thing as share or borrowed capital. It was a permissive bill for the purpose of applying a given amount of the company's capital to Norwich, taxable with a certain rate of interest. The committee should look at the matter in this way. They were about to sanction an aggregate capital or sum of £200,000 to be spent at Norwich; but they could not ear-mark it because the share capital was a thing they could not see or touch.

The CHAIRMAN: We only allow £100,000.

Serjeant SARGOOD said that no doubt they did, but here was an aggregate sum of £200,000, which it was proposed to assimilate as in an ordinary company. This £200,000 ought to represent £40,000 of borrowed capital, and £160,000 of share capital; which would be the proportion if the company were put under the ordinary provisions. What he would propose as the method of dealing with the company was this—that whereas gas companies were usually authorized to raise a portion of their capital by shares, the British Gas Company were not subject to such parliamentary restrictions, therefore the profits should be divided upon the capital to be expended under the provisions of the Act—viz., 7 per cent. per annum in respect of three-fifths of the total amount from time to time actually expended, and 4 per cent. in respect of the remaining two-fifths. The absolute necessity for adopting this course arose from this—that the share capital could not be altered. To introduce the word "shares" or "borrowing powers" was anomalous, because the committee had no power over either of them. Neither would it be convenient to talk of a dividend upon a fixed sum of money, because the moment a high rate of dividend was allocated to a fixed sum of money, the company might elect to spend the whole of that sum of money, say £60,000, and to call it share capital, for the sake of securing the higher amount of dividend. But if the company were placed on the ordinary footing of recognizing out of their £200,000 a fifth as borrowed money, then as £40,000 represented one-fifth, the committee should deal with the money in bulk in those proportions, and that as regarded any portion from time to time expended, there should be a rateable dividend upon three-fifths of the higher amount, and also upon two-fifths of the lower amount. Supposing 7 per cent. was recognized on £60 out of £100, there would be 4 guineas on the £60; and if 4 per cent. was taken on the £40, the two taken together would amount to £5 16s. per cent. on the whole sum, without the committee being distressed by ear-marking any portion of it with any name, or by having to ear-mark it by any money's number. If the committee thought £5 16s. was not enough, 4½ per cent. might be granted for the borrowed money, which would amount to 6 per cent. That was the only principle he thought which could be carried out under the Act, which he believed contained the spirit and intention of the committee with regard to the company. He demurred to what his learned friend had proposed, because it would be more oppressive than letting the matter alone. The whole principle of the bill was wrong. All the committee had said to the company was, "You may go and spend £100,000 and we will settle the rate which shall be a return." Then as to £40,000 of that, he would say that it should be considered as the borrowing power of the company. That would be two-fifths of the whole amount. The remaining three-fifths should be the share capital; and he left the committee to say what the dividend should be on those two proportions. He would not propose to alter the 7 per cent. which could be taken on the £60,000, and 4 per cent. on the borrowed part would give £5 16s. That, he thought, would meet the views of the committee, and in his judgment was (he said it with great submission) the only way in which the matter could be carried out.

The CHAIRMAN said he did not think it right to go back to the £100,000 that had been spent. The impression of the committee was that they should not interfere with that; but that they should only deal with the £100,000 about to be spent.

Serjeant SARGOOD said he was only asking the committee to divide the present amount in such a manner as they should think equitable.

Mr. MICHAEL thought that a very few words would suffice to make matters clear. A gas company would, under ordinary circumstances, have to get persons to subscribe after the bill was passed, whereas the company had already a body of subscribers who were willing to take up the shares. Under ordinary circumstances a company would say, "We have expended £100,000; we require to spend some more." The committee might say that £100,000 would not be an improper sum. They would then in a case of that kind determine that £100,000 should be the total allowed; that sum would be divided into two parts, representing capital and borrowed money; and, according to all precedent, it would be divided into £80,000 and £20,000. The only possible difference was that in an ordinary case £20,000 would be called up for immediate contingencies, shares being allocated to that amount; whereas in the present case a larger constituency was appealed to, which already held shares; and it might not be necessary to ask for so large an amount at one call. The company was in all respects similar to a company operating in Norwich alone, and in no other place. The accounts of the company at Norwich were quite distinct from those in London, so was the capital and so were the profits, and the accounts were audited separately. It had always been customary to allocate one-fourth for borrowing purposes, and that it should be surrounded by restrictions. It could not be supposed that a company would pay 6 per cent. for borrowed money when they could get it for 4 per cent. He believed the committee had decided the question, and that they had determined not to depart from the usual mode, in such cases, therefore, he proposed to adhere to £80,000 and £20,000. It was not suggested that the company was not well and properly conducted, and there was nothing to warrant it to be taken out of the ordinary category.

The REFEREE: You would make 7 per cent on the divisible profits.

Mr. MICHAEL: Exactly so. Parliament says, "You shall not charge beyond a certain price. If at that rate you can make 7 per cent., you shall have it."

The CHAIRMAN said his difficulty was that the power sought by the company was a power to expend money, and to obtain upon the amount expended a certain rate of interest. If the committee authorized the company to spend £100,000 and allow 7 per cent. to be earned on the £80,000, and did not say what interest would be allowed on the £20,000, the company would either not be able to earn any interest at all or would fall back on the General Act which regulated the interest; and under that Act they would have the right to earn 10 per cent. on the £20,000.

Mr. MICHAEL: Not on borrowed money, but on share capital.

The CHAIRMAN said that was the point. As far as he could remember there was no distinction between the different methods of raising money.

Mr. MICHAEL pointed out that there could only be 10 per cent. on the share capital. As to the £20,000, the company was limited to the raising of that upon a mortgage of the works, and shareholders would never allow their works to be mortgaged to a person who advanced money beyond a current rate.

The CHAIRMAN: Of course the shareholders would mortgage it to themselves?

Serjeant SARGOOD said he would be content with a 7 per cent. dividend upon £80,000, on the terms of four-fifths of capital laid out and expended, and on no more. The moment the company were allowed to borrow at a lower rate than 7 per cent., they were allowed to do what other companies were not allowed to do.

The CHAIRMAN asked what the result would be as to the other fifth; would not they go back to the General Act?

Serjeant SARGOOD: No; not if the committee says "they shall have no dividend beyond a dividend on four-fifths."

The CHAIRMAN thought that would not be at all fair.

Mr. MICHAEL thought his friend was afraid to say what he really meant. What he really wanted was that the committee should say, "You shall, from time to time, as you expend money, only have four-fifths of that money in capital, the other fifth shall be in borrowed money."

The CHAIRMAN: That would be very complicated and difficult, and the committee do not propose to do that.

The room was cleared for the deliberation of the committee, and on the parties being readmitted,

The CHAIRMAN said that the clause which had been discussed would stand thus: "Notwithstanding anything in the Act of 1858 contained, the company may expend, for the purposes of this Act, the sum of £100,000 in addition to the said sum of £100,000 already expended under the power of the Act of 1858. Provided always that of the said sum of £100,000 by this Act authorized to be further expended, the sum of £80,000 shall be so expended out of the capital stock of the company, and the company may from time to time borrow on mortgage at a rate not exceeding 5 per cent., in respect of such further capital so authorized, sums not exceeding in the whole the sum of £20,000. Provided further that the profits to be divided by the company in respect of so much of the additional capital of £80,000 as may from time to time be actually expended shall not exceed £7 per cent. per annum in respect of so much thereof as shall be issued as ordinary capital, and £6 per cent. per annum in respect of so much thereof as shall be issued as preference capital."

The clauses having been gone through, the chairman was ordered to report the bill to the House.

OXFORD (CORPORATION) WATER BILL.

Mr. PEMBER, Q.C., appeared for the promoters; and Mr. CLERK, Q.C., for the Conservators of the River Thames, who opposed the bill.

Mr. PEMBER, in opening the case for the promoters, said that the corporation had provided for many years a water supply for the town of Oxford, close to Folly Bridge. For nearly 200 years they had taken water from the river Thames, their right to do so being prescriptive. There was no limit to their prescription; they had a right to take an unlimited supply from the river. They had always possessed that right, and it was not disputed. As time went on it was found necessary to bring the works under the Act of 1847, the Water-Works Clauses Act of 1863, and other Acts passed since. But that had nothing to do with the Conservators of the River Thames. One reason why the promoters appeared before Parliament was that they found it was necessary to get powers to construct a certain reservoir upon Headington Hill. They also found it necessary to expend £19,000 to break up streets, and so on, and that could not be done without the sanction of Parliament. They were being opposed by the Conservators of the Thames by a mere accident. It was proposed to lay down a line of pipes which would cross the river Thames and the land underneath the bridge, and the river had been unnecessarily scheduled. Some time ago, in a Windsor and Eton Bill, the corporation endeavoured to establish their *locus standi* to enable them to lay restrictions upon the taking of the water, but were beaten. The petitioners now asked Parliament to control the corporation in the use of water which hitherto they had had an unlimited power to use, and they also sought to prevent them taking more than a certain quantity of water, and from serving certain persons who required the water, and who could get it in any other way. They wished, in fact, to prevent the corporation from doing that which they had a perfect right to do. The question was whether Parliament would allow them to do that. The quantity of water required would not for many years be more than it was at present, although the limits of the bill would enable the promoters to supply persons who were not at present supplied. The real object sought by the bill was stated in clause 6: "The limits within which the corporation may supply water under this Act shall be the district within the parliamentary boundary of the city of Oxford, and such part or parts of the following parishes and places as may not be within the said Parliamentary boundary, namely Saint Aldate, otherwise Saint Tolls, partly in the county of Oxford, and partly in the county of Berks, North Hinckesey, and South Hinckesey, in the county of Berks, Cowley Headington, Iffley, otherwise Yeftley, Wolvercot and Littlemore, in the county of Oxford." The real object with regard to the outlying districts was to supply a large military centre on Bullington Common, and a lunatic asylum at Littlemore. All the water proposed to be taken was within the area of the Thames watershed, and would, after filtration, return again to the Thames. The more water taken for supplying the town and neighbourhood the more water would in consequence be brought down in connexion with the sewage, and thus the more completely would the sewage be diluted.

The CHAIRMAN said he had been looking through the petition of the Conservators of the Thames, and could hardly see to what they objected.

Mr. PEMBER pointed out that his learned friend would have to be confined to his petition, which said that they, the conservators, were incorporated by the Thames Conservancy Act of 1857, and were interested in the bed, soil, and shores of the river Thames from Staines to Yantlet Creek. Also by the Navigation Act of 1866 they had power over the locks, canals, works, toll-houses, &c., which had nothing whatever to do with the right of the corporation to take an unlimited amount of water from the river. Then, by the Act of 1867, the powers of the conservators were extended; but it was only an amplification of the Act of 1866, giving them jurisdiction for the purposes of the Act of 1866. The petitioners said they had received notice from the promoters that it was intended to take compulsory powers over certain lands, &c. That the promoters withdrew in the fullest sense. The gist of the petition was in clause 9, which said, "It appears from the plans and sections deposited in pursuance of the Standing Orders of your Honourable House, that the promoters will or may take more water from the river Thames than they can take at present if the proposed works are executed, and your petitioners submit that no such power should be exercised except with the consent of your petitioners who are the owners of such waters, and bound to preserve the waters and navigation of the river Thames." They were bound to preserve the navigation, but they had no power to prevent the Corporation of Oxford from taking as much water as they pleased. He denied their ownership, and the *onus probandi* lay upon them. He did not think the petitioners had a right to come before Parliament and ask that the powers of the corporation be curtailed simply because the corporation happened to require certain works necessary to enable them to use an unbounded power. Why should the conservators seize upon that opportunity to say to the corporation, "You shall not have more than a certain amount of water," when, by the unwritten law of the realm, the corporation had the power to take water as they pleased. The only persons who could raise valid objections were owners or consumers, but from these no objection had come; in fact, they desired to have the water.

The CHAIRMAN said that three classes which might object were the owners, the inhabitants of Oxford, and the surrounding villages. Mr. Pember's assertion was that the corporation had an indefeasible right by prescription to take as much water as they pleased, and that the inhabitants both of Oxford and the villages wished to have it.

Mr. PEMBER said that that was so; and he therefore failed to see in what way the Conservators of the Thames could object to the powers sought. He understood that at present there was great waste of water from the mode in which the town of Oxford was supplied. That waste the promoters hoped to

reduce by the exercise of the powers they were now seeking. Oxford was a growing place, and if a restrictive clause were put into the bill, it might come to this, that after a time the corporation would be unable properly to supply even the inhabitants of Oxford with water.

The first witness called was

Thomas Hawksley, Esq., examined by Mr. PEMBER.

At present the Oxford Corporation supply the town of Oxford and places a little without the city with water. The water is taken from the river Thames. It is taken from a large excavation which was formed at the time the Great Western Railway was made, into which water filters from the Thames. The railway got ballast from that place, and so made a large pond, into which the water of the Thames infiltrates. That is 12½ acres in extent. We have found it necessary to bring our water-works under the General Water-Works Act. We have been working under no Act of Parliament hitherto, and have not the requisite powers which are contained in the Water-Works Clauses Act. When once a company or corporation comes under statute, they are bound to have in their Act the prescribed limit in which they may serve water.

By the CHAIRMAN: At present we are not acting under any parliamentary power, therefore have no prescribed limits except those that are inferential.

Examination continued: We find it necessary to expend money, and for that purpose convenient to have parliamentary powers. We require £19,000 additional capital for the purposes of this Act. The proposed works are confined to a main pipe, and a service reservoir at an elevation above the town. Oxford is a growing town, and to supply it with water we should have to break up streets which are not under the jurisdiction of the corporation. There is a difficulty as to some of the bridges. In order to get our pipes to the points necessary, we shall require parliamentary powers. We have already some power under the Water-Works Act. In the original scheduling, the property of the Conservators of the River Thames was scheduled. That was unnecessary. We are perfectly ready and willing to strike that out. The amended bill provides for that. The object of the proposed high level reservoir is to enable us to give constant service day and night; hitherto, the service has been dependent on the engine power.

By the CHAIRMAN; There are no other sources of supply besides the river.

Cross-examined by Mr. CLERK: We have no plan showing the limits of the city of Oxford, only the parliamentary plan. It only shows that part of the city through which the works pass. The villages we propose to supply are within two miles of the banks of the Thames.

By the CHAIRMAN: They are within the watershed of the Thames. All the water would go into the Thames if we did not take it and use it.

Cross-examination continued: That may be an engineering view. The prescription, said to exist for 200 years, was for the city of Oxford to take water.

Mr. PEMBER objected to questions as to limitation of prescription being put to the witness.

Cross-examination continued: I have been consulting engineer to the water-works for 20 years. One of our chief objects is to supply the asylum and the new depôt which is set out to cover 40 acres; the Government have applied to us for that purpose. We have a pump near the ballast excavation already. I cannot say whether it will remain there or not, but it is there at present with three steam-engines.

By the CHAIRMAN: We do not know that we shall have to strengthen our pumping powers.

Cross-examination continued: That would be shown upon the plans—that is, if we were going to put a new pumping station; but if we were going to put a 200-horse power instead of a 20-horse power engine, that would not be shown. We do not propose with the capital we ask for to put larger engines than we have at present; hereafter we may have to do it. The whole of this capital is devoted to the main-pipe and the reservoir—every farthing of it; and you will observe by those plans that we do not propose to do anything more whatever. I do not think we shall require greater pumping power than at present if we include the villages and the depôts also when that pipe is laid to Headington Hill. It may be that we shall. I think not, because our present system of service, without a reservoir and without proper regulations, actually demands 120 gallons per head per diem; it is the largest supply given in any town in the kingdom.

By the CHAIRMAN: Cambridge has only 18 gallons per head per day. In one place 25 gallons is supplied, and of that 7 are for trade purposes.

Cross-examination continued: I say that of the water that is at present taken, if it be properly economized, and waste prevented, there may not be a much larger quantity taken than now for many years. That will be so, I hope, after two years; it will take us that time to make our works.

By the REFEREE: The excavation we have does act as a service reservoir. The water is pumped through the town; all the inhabitants take the water that goes through the main-pipe; the surplus runs into the reservoir again, then that surplus goes back into the town again, and so on.

By the CHAIRMAN: The estimate is a proper and reasonable estimate, and sufficient for the purpose.

By the REFEREE: The new reservoir will be a storeage one, but not in the ordinary sense; it is rather an accumulating and regulating reservoir—it accumulates the service, and regulates the power and the *quantum* of supply by its apparatus when the engine ceases to work.

By the CHAIRMAN: There will be great economy, no doubt, in consequence of the power which we seek; of that there can be no doubt. I think it is reasonable that those villages should be supplied from the same source as the town of Oxford; they are all connected with Oxford, and they are all very badly off; they require the water, and they have no opportunity of getting it elsewhere, except by going to little springs in the neighbourhood.

This concluded the case for the promoters.

Mr. CLERK addressed the committee on behalf of the Conservators of the Thames, who were not, he said, seeking to oppose the corporation in getting their works put under statutory control. By the Act of 1857, which recited the disputes that had from time to time arisen between the corporation and the Crown, all rights were handed over to the Conservators of the Thames. That referred to the lower navigation—namely, from Staines to the Medway. The Conservators of the Thames had a right to the water, conveyed to them by Acts of Parliament, and all the different water companies paid so much per annum to the conservators, amounting to a total of £6000 a year, to enable them to discharge their duties in preserving the purity of the river. No sewage could be discharged into the Thames without the permission of the Thames Conservators. Under the Acts of 1864 and 1867 the purification of the water of the river was provided for, and they were bound to maintain both its quantity and purity. Ultimately the same powers as to the upper portion of the river, above Staines, were given to the conservators; and, in consequence, five additional conservators were added. No person could extract water from the river Thames without the consent of the conservators.

The CHAIRMAN said that the company claimed a prescriptive right to take water from the river to an unlimited extent, and that was not disputed.

Mr. CLERK pointed out that what the Corporation of Oxford claimed was a prescriptive right over 60 years, which he did not dispute. But that prescriptive right was for what purpose? It was perfectly clear that it was for supplying the city of Oxford only, and not places beyond that area. The petitioners did not object to the corporation asking for parliamentary power; for it gave them the power to control the absurd waste of which Mr. Hawksley had spoken; neither did they dispute the right of the promoters to take water for the city of Oxford alone; but they did object to such a quantity of water being taken as enabled the corporation to supply a large area beyond the city of Oxford, and that, too, without the consent of the Conservators of the Thames, who had a parliamentary duty cast upon them to see that the water was not improperly used. None of the companies now taking water from the Thames could take an additional quantity without the consent of the conservators.

The CHAIRMAN observed that those companies did not take by prescriptive right.

Mr. CLERK said that some of them did; but those powers were given up.

The CHAIRMAN: Practically there was a sale, then, of prescriptive rights for other rights?

Mr. CLERK: Perhaps that might be. He did not dispute the right of the city of Oxford if it had a population of double its present number. But when it came to be a question whether they should be allowed to supply a large area two miles away from the banks of the river, then he thought Parliament should not allow them to take the water required without giving notice to the Conservators of the River Thames.

The CHAIRMAN: If they are not to take an amount of water beyond that which they are taking now, that will be limiting their prescriptive right.

Mr. CLERK said that the only prescriptive right the corporation had was to supply the city of Oxford.

Mr. PEMBER maintained that the corporation claimed a prescriptive right to take an unlimited supply of water. If they were to be limited to any particular amount, they might some day find that they had not a sufficient quantity to supply even the city of Oxford.

Mr. CLERK said the preamble of the bill did not say the corporation had a prescriptive right to supply other districts besides the city of Oxford.

The CHAIRMAN said that the corporation had a right to take any quantity of water they liked. For public reasons, it was alleged to be desirable to extend the area of their water supply, and they asked the House for power to do that. If the permission to supply were given, they had the power to take.

Mr. CLERK said the corporation could only take for the city itself. To say they had the power to take water beyond their own requirements was unreasonable. They might be proceeded against at common law, or by injunction in Chancery, if they went beyond that.

The CHAIRMAN said that the common law with regard to prescription was, that if power was given to any company or corporation to take water, it meant that they could take as much as they required. The conservators had taken the water (if they had taken it) subject to that right of prescription, and subject to all other rights of prescription. The question which arose was this—Did the right of the Corporation of Oxford which existed to take water also cover the right to distribute it over a particular area? At present they had a right to distribute it only over Oxford; but if the House gave them a right to distribute it over a larger area, the right to do so could not be disputed.

Mr. CLERK said he could not conceive of any right the corporation had to take water, except for their own purposes.

The CHAIRMAN said that under prescription they could not be limited as to amount.

Mr. CLERK said he was only asking for the same protection for the conservators as had been given them in other cases.

The CHAIRMAN said that the petitioners proposed to limit the prescription of the corporation. But if Oxford should 100 years hence be five times as large as it was now, the corporation would not be able even to supply the city, if the House agreed to the proposition of the conservators. It was asking a committee of the House of Commons to limit a prescriptive right. The point in the whole case was that the city of Oxford had a prescriptive right to the water to any extent which was not disputed, and the House ought not to limit it.

Mr. CLERK still contended that the corporation ought not to have the extension of area.

Mr. PEMBER maintained that the corporation had a right to take water unlimitedly, and that was unchallenged by the petitioners. Their powers to distribute it alone limited that amount. Was it an unreasonable thing that villages, situated as those villages had been shown to be, should be supplied with the water when they themselves desired it, and the corporation were willing to supply them with it? That was the whole point of the case, and he believed the House would grant them the powers they sought.

The room was cleared for the consideration of the committee; and, on the parties being again admitted,

The CHAIRMAN said that the committee considered that the preamble of the bill was proved. The committee would allow the enlarged area, as they did not wish to limit the prescriptive right of the city of Oxford to take the water.

The preamble was read and agreed to.

The clauses were severally read and agreed to, with amendments.

Mr. WYATT, on behalf of the conservators, proposed a clause to the effect that no new works should be executed without the consent of the conservators.

The CHAIRMAN stated that the committee would not consent to such a clause, and that they did not wish to limit the prescriptive right of the Corporation of Oxford to take water, and that they had decided to sanction the enlarged area. He was directed to report the bill, as amended, to the House.

TUESDAY, MARCH 16.

COLCHESTER GAS COMPANY'S BILL.

Mr. LITTLER, Q.C., and Mr. MICHAEL appeared for the promoters; Mr. VAUGHAN RICHARDS, Q.C., and Mr. PHILBRICK, Q.C., for the Corporation of Colchester, who opposed the bill.

Mr. MICHAEL, in opening the case for the promoters, said this was "a bill for authorizing the Colchester Gas Company to raise additional capital for increasing the rates, rents, and charges which the company are now authorized to take, and for other purposes." The preamble recited that the old company had parliamentary powers for providing Colchester with gas. The works had been for some time in the possession of a lessee; there were well-founded complaints as to the supply of gas, and in 1866 the company came to Parliament and obtained power. There was £20,000 original capital, with a limitation of a dividend of 10 per cent., and a power to borrow £5000; and by the Act of 1866 an additional capital was authorized of £20,000, and a power to borrow £5000. The present position of the company was this: They had the original capital of £20,000, and they had borrowed the £5000; but they had only raised £12,000 of the additional capital, and so had no power to borrow their £5000, the borrowing of that not being permitted until the whole £20,000 had been raised. They had, therefore, spent the whole of their capital except £3000. That had brought them to a dead standstill, owing to circumstances which he would briefly relate to the committee. The promoters asked for an increase of capital, which they had very modestly placed at £10,000, and the ordinary borrowing power of £2500. Upon the first £20,000 the limitation was that of the Gas-Works Clauses Act—namely, 10 per cent.; on the second £20,000, the limitation was 7 per cent., with a power over the whole capital of raising it by preference shares of 6 per cent. What was asked was that the additional £10,000 should rank equally with the original capital at 7 per cent., and by the powers granted in 1866 the company were authorized to raise debenture stock, the limit on which was 5 per cent. For the first year after the passing of the Act of 1866, the company were obliged to charge 4s. 6d. per 1000 cubic feet as a maximum, or, in reality, 4s. 3d., and they charged 1s. 8d. a foot less to the public lamps. The burner was an Argand, having a 7-inch chimney, but the Sugg's burner had been found to be superior, and the illuminating power was 14 candles. The amount expended had been, in round numbers, £37,000. In 1867, when the Act of 1866 became law, the charge for coal at Colchester was 14s. 2d. per ton delivered; and they realized for residuals

6s. 9d. That left the net cost of coal at 7s. 5d., which, worked out, made the net cost for coal at the consumer's meter 1s. per 1000 cubic feet. The present price of coal was 28s. 9d. in the company's works, the residuals realized 9s. 2d., leaving the net cost 19s. 7d.; which, worked out, gave 2s. 6d. for coal per 1000 cubic feet at the consumer's meter. That made a difference of 1s. 6d. in every 1000 cubic feet of gas, and added to 4s. 3d. (a fair price in 1866) would bring the price to 5s. 9d., and make the conditions parallel between 1875 and 1866. The price should be changed from 4s. 3d. to 5s. 9d. In other words, if 4s. 3d. in 1866 would pay a dividend of 10 per cent. on the old capital, and 7 per cent. on the new, then the price to-day ought to be 5s. 9d. The company had never been able to realize their statutory dividend since 1866. During the last year they had paid nothing to their shareholders. The matter stood thus: coal cost 43·35d., the residuals realized 13·79d., leaving net for coals 29·56d.; working expenses 19·36d., total expenses 48 92d., dividend and interest 14·60d., worked out gave 5s. 3¼d. The whole of the balance-sheets since 1866 would be put in. He would be able to show that, having regard to the capital employed and the gas made, the company would bear comparison with any of the London companies. He would show that the working had been well carried out in every respect, except that more capital was required, and the directors were unable to raise it on the shares. Some of the works were greatly in want of improvement, the retorts were in a very bad state, and altogether that part of the works was in a very unsatisfactory condition. A sum of £7000 would be sufficient for the necessary improvements, but that could never be realized unless the company were allowed to have an increase of price commensurate with the great increase which had taken place in the cost of producing gas. It was said that the concern was not economically worked, but the accounts showed that that was not so; there was only one year (the year 1873) to which such a remark could be applied, because in that year a larger amount of coal was charged than was required for the gas made. The fact was that 240 tons of coal then charged belonged in reality to many previous years; but, in consequence of a thorough overhauling of the accounts, the quantity of coal was given in one gross sum in that particular year. As to the allegations in the petition, the committee would be able to see from the evidence that they were altogether without foundation. The petitioners denied that the price at which the company was compelled to make gas was unremunerative; whereas it was palpable that, if 4s. 3d. was the proper price to charge in 1866, when coal cost 1s. per 1000 feet, it must be a most improper and unremunerative charge when coal cost 2s. 6d. per 1000 feet. The corporation declared that they had the charge and superintendence of the streets and so on, all of which only meant that they had power to contract with any parties for three years in order that certain things might be done. He had no objection for them to superintend—as they said they had to do—the well-being of the town generally. The corporation further alleged that the company charged what they pleased, and divided very large profits. That was not so. They then spoke of the company having applied to Parliament in 1866, and of the agreement that was come to between the company and the corporation at 4s. 3d. per 1000 cubic feet. That was a reasonable arrangement in 1866, but it was one which it was impossible to abide by now. The corporation would not have been content that the company should continue to charge 4s. 3d. per 1000 cubic feet if coals had fallen so low as to cost nothing at all; it was, therefore, unreasonable, now that prices have so much increased that coal now costs 1s. 6d. per 1000 more than at the time the agreement was made, that the company should be asked to abide by that agreement. Yet the petitioners insisted on saying that 5s. 9d. was too high a charge—that 4s. 3d. was a sufficient price for all ordinary purposes. The fact was, it was sufficient for all purposes except the dividend. The company had never been able to pay the dividends which Parliament declared to be fair upon their capital. They had been obliged to take the money which should have gone into the pockets of the shareholders, and use it for the working of the concern. The corporation objected to the raising of the price for lighting and cleaning the public lamps, but if 13s. was fair in 1866, surely 17s. was only a fair equivalent in 1875. They also protested against the testing of gas at the works, but it was necessary that it should be done at the works for reasons, no doubt, quite well known to the committee. It was there that the photometer should be placed. They were quite willing to have their gas tested at any time and by anybody. No allegation had been made, not even by the petitioners, against the character of the gas, either as to its quality or quantity. The company asked to be placed in the same position as they were in 1866. They had up to the present time fulfilled all their parliamentary obligations, but circumstances had so altered that they felt justified in asking, even in the interests of the consumers themselves, for some alteration in their favour. It was absolutely necessary that more capital should be raised in order that the gas might be produced in a more economical manner, but capital could not be raised under existing circumstances, therefore he trusted the committee would deem it right to pass the preamble of the bill.

Mr. *J. B. Harvey*, examined by Mr. MICHAEL.

I am a magistrate of the borough of Colchester, and chairman of the board of directors of this company, and have been so since 1866. I have been chairman of the Colchester Improvement Commissioners for nearly 20 years. I took an active part in obtaining the Act of 1866. The price of coal in the yard at that time was 14s. a ton. That being so, I consented to have the price of gas put at 4s. 6d. for one year, and 4s. 3d. for after years. Our dividend during the last four years has been—in 1871, 8 per cent. on the old shares, and 7 on the new; the same in 1872; 5 per cent. in 1873; and in 1874 nothing. We have never paid our full parliamentary dividend. We have never been able to earn it. The price of coal at the present time is a little over 22s., delivered in the yard. Last year it was 29s. 6d. or 29s. The price of other materials has gone up in the same ratio. We have also had to pay more for wages. The town of Colchester is a wide and straggling area, requiring a great number of mains in order to supply it, and that involves many lengths of almost useless mains.

By the CHAIRMAN: I mean that there are certain lengths of pipes on which there are no consumers.

Examination continued: Those lengths of pipe are necessary for the public lighting, but they bring in very little revenue. I have come to the conclusion that it is necessary to spend a considerable sum of money to improve our works, especially in the retort department.

By the CHAIRMAN: We have never had a coal contract; we get tenders from owners. We get 5000 or 6000 tons at a time as cheaply as we can.

Examination continued: We have come to a standstill for want of capital. We want more capital, and that at once. We have spent money out of revenue for capital purposes to some extent; we have spent some hundreds of pounds on a scrubber, and a large amount on some retorts.

By the CHAIRMAN: We told our shareholders of that. We require to have the gasholders renewed, and that will cost £2000.

Examination continued: We have never earned our parliamentary dividend. Any money that we have expended has been taken out of the pockets of the shareholders, but they know of that; otherwise it would have gone to make up the parliamentary dividend. I do not think we could have allotted these shares except at a discount. We divided no dividend whatever for the year 1874. Our accounts are made up to March 31 in every year.

Cross-examined by Mr. PHILBRICK: We have never made any attempt to obtain the £8000 of capital; we thought it would be useless. We have felt the necessity of it for two years or more, to improve the works, especially the carbonizing part of them. The £12,000 under the Act of 1866 was raised on the 8th of August, 1866. We issued shares to raise it, and obtained a loan on mortgage on the 27th of June, 1867. Of the 250 shares we only issued 100. The last shares were issued on the 27th of June, 1867. Since 1867 we have not attempted to issue any shares. We did not feel the necessity till within the last two years, and we then thought it would be useless on account of the state of our finance. From 1867 until now no share has been issued, and no attempt made to raise the capital. At the time that we were issuing the last shares in 1867, we were paying a dividend of 7 per cent. The next year we paid the same, in 1870 and 1871 the same on the old shares. At the time the old capital was at 8 per cent., and the new at 7, we did not want to issue any further shares. We did not think it desirable to raise the capital then. We have had money in hand to the amount of several thousands, as shown in the accounts; but it was not available for dividends; we had nothing to work with—no floating capital. We had no money in hand. We never issued capital at 8 per cent. premium to any one. The gas-works are not badly situated. They are situated practically upon the river, with the wharf road between the works and the quay. The dues at the port are 4d. a ton. I know Ipswich. I do not know if there are heavier dues there. We are making 50 million feet of gas a year. The population of Colchester is 26,000. I think Ipswich has 46,000. Ipswich is charging 4s. 3d. for gas.

By the CHAIRMAN: It is much more difficult to make gas at a small town than a large one. The population at Ipswich is much more compact; they can, therefore, be much more economically supplied.

Cross-examination continued: We have made improvements in the works since the Act of 1866. We get our coal direct from the North; it is brought up the river to Wyvenhoe—that is the deep water point; then we lighter it from there to our own yard. I believe we pay more than 18s. 6d. a ton. I have not the figures with me. The coals will cost us 22s. for this season. We are paying more for wages now than during preceding years. We advanced the wages about two years ago. That last year shows the smallest aggregate amount for wages is due to this, that our new manager, while he has paid the hands employed more money per week, has got rid of a number of useless hands. Our residuals are sold into the town, or wherever we can find a customer.

By the CHAIRMAN: The ammoniacal liquor only brings £30 for six months; the contract for the tar is 1¼d. In improving the works the company have acted under the advice of their new manager, Mr. Browning. In our balance-sheet we show a loan from our bankers. We borrowed it because we had not sufficient working capital. And we used some of the money which would have gone to dividends, hence the accumulation of balance at our bankers; still that was not sufficient, and we had to borrow from our bankers.

Re-examined by Mr. LITTLER: We tried to please the public and keep down the price, till we found ourselves without a dividend. Although we ask for a maximum price in this bill, it does not follow that we shall necessarily do other than we have been doing. At Ipswich coal can be run right into the yard.

By the CHAIRMAN: When we found we could not go on any longer without additional capital, we found we were working at so small a profit that we thought we could not go with any chance of success either to the shareholders or the public. That is the reason why we did not apply to them; we thought we should fail if we did. We did take competent advice as to what we should require to spend upon our works. The shareholders are mostly Colchester people, and we know what the public feeling is on the matter. We meet our shareholders yearly. It has been our constant practice to borrow money from our bankers in order to carry on our works.

Mr. *J. T. Browning*, examined by Mr. PHILBRICK.

I have been with the company since 1873. My predecessor was Mr. Rowan. We use cannel coal,

By the CHAIRMAN: Our make is about 9000 feet per ton of coal.

Examination continued: Our cannel costs us about 57s. I am right within 100 feet as to the make. I do not know what our sale is at this moment. We are paying at the present time for coal 13s. at the pit's mouth. Our freight is 7s. 3d.; our lighterage, 6d.; the port dues, 4d.; meterage, 1d.; and porterage, 1s. That makes altogether 22s. 2d. a ton. I am not the bookkeeper; I have a clerk under me. I do not know where the carbonizing book is. I have not got the station-meter book. We are producing 9000 feet per ton, and sell about 7700 feet. The carbonizing book has been brought to London, I believe, but I have not got it with me.

The CHAIRMAN: I do not think the production of that particular book would affect the conclusion of the committee. The smaller the station the more difficult it is to work it. Nine thousand feet is not a bad make, although not a first-rate one.

Mr. *G. W. Stevenson*, examined by Mr. LITTLER.

I have examined the accounts of the company, and the works at Colchester. I went down on Jan. 28. There has been no expenditure on capital account since 1869. I consider that at the present time a very considerable amount of expenditure is necessary. The retort part of the works is in a very unsatisfactory condition. The company are not able, even with the greatest care in management, to get what they ought to get from each ton of coal. The retorts are in a hole; the coal has to be shot down to them, and the coke lifted up. The position of the retorts being in a hole is prejudicial to the working; the gas cannot be got out of the coal to the extent it otherwise would be.

By the CHAIRMAN: It is a fact that not only the quality, but the size of the retorts, and other circumstances have to be considered before you can decide whether there is a good make of gas per ton of coal.

Examination continued: The heat of the furnaces is much reduced by their present position. They are very unfavourably situated for making the gas. It is necessary to build a new retort-house and erect new retorts. Under the circumstances, I think the manager has made very fair returns. I am surprised that he has done as well as he has.

By the CHAIRMAN: The actual make is 9183 feet per ton of coal; the sale 7961 feet; and unaccounted-for gas 1222 feet. That is a very fair make, though not what they will be able to make when they have additional capital and reconstruct their carbonizing department.

Examination continued: They will have to expend at least £7000, and I am afraid more; 120 retorts are wanted, for it does not do to build just for the present time, they must have some regard to the future, and they require 100 now. Supposing they can make per day 300,000 feet, they ought to provide for a make of 400,000 feet. The retort-house and coal stores will cost, together with the retorts, nearly £6000. They want additional houses on the works, and condensers, which will take another £1000, and they ought to have a landing stage and steam-crane to get the coals out of the barges to the retort-houses; that would cost £1000; that makes a total of £8000. In addition to that they ought to have a margin for contingencies. They are asking £10,000, but, in my opinion, they should have asked for more. The £8000 will all be required immediately. In fact, I think they will be obliged to come to Parliament again before another ten years is out, to grant them a further sum. I have examined the books and accounts of the company to satisfy myself as to their past working. I think they should have raised more capital before this. They have, if anything, been too sparing in their management. They have been compelled to use their undivided profits as working capital. The condition of the company at this time is not due to mismanagement; it is entirely due to causes over which they have had no control. All the items or working expenditure are less now than they were in 1866; that proves that they are working more economically now than they were then. Their wages were higher than they are now. The repairs in 1867 were 7·92d., now they are 7·73d. The salaries are all lower than they were, and the capital

employed is less now than it was then. With regard to most of the items, they are less than those of metropolitan companies. I do not think the company can ask for a less maximum charge than 5s. 5d. There are other districts having a higher maximum than that. The total sale is 44 million feet a year; of that 4,500,000 is for the public lamps, and 7 millions odd goes to the barracks. What I wish to say is that the price to the barracks is lower than to other consumers because of this. The barracks have a 6-inch main from the works to the barrack department; it is three-quarters of a mile long. There is a meter at the entrance to their premises. They lay their own mains throughout their premises, and distribute the gas themselves. They shut a valve when they have done consuming gas at night, so that the main conveying gas from the works to the barracks, is absolutely a dead main. There is no loss by leakage; that, in my judgment, justifies a lower rate of charge to the barracks.

By the CHAIRMAN: Colchester is rather a straggling town. I am told that there are 13 miles of additional mains required in consequence of the distance at which the points to be served are from each other; but I do not know of my own knowledge.

Cross-examined by Mr. PHILBRICK: I know that the cavalry barracks have been extended, and that a fresh supply is being given. I do not know that that is the part where the extension is now taking place, and that both cavalry and infantry will be served from the mains. I do not think there is any circumstance in Colchester which would render the supply of gas more difficult than in any other provincial town. From their situation the works ought to produce a good working. A make of 55 millions is quite sufficient to enable the company to avail itself of recent improvements in the make of gas. Assuming all improvements to be made, 9500 feet per ton would be a fair amount to make—in fact, when they have got their carbonizing department into proper order, they would, no doubt, make 9800 feet. Thirty-three per cent. would be quite sufficient to allow them for their coke. Their gas-rental has been steadily increasing and also the coke; the other residuals have gone down. I cannot account at all for that. The expenditure on wages is absolutely less per 1000 cubic feet sold than it was in 1867. The actual figures come to less—£1095 in 1867, as against £1084 in 1874. I mean to say that generally the expenses are less now than formerly. There had been a large expenditure for maintenance, and that was required, because the company were not calling up capital; a larger expenditure was necessary for repairs, and that came out of the pockets of the shareholders, because the company never earned their maximum dividend in any one year. The cost of coal consumed by this company in 1873 was £5390; in 1874 it was £7989. The sale of gas in 1873 was 44,104,000 cubic feet; in 1874 it was 44,227,000. That is accounted for by this, that the coal contracts of 1873 took them on into 1874. The price of Pelaw Main coal now in the market at Newcastle is about 13s. a ton. I do not know what the price of that coal was in 1873. I do not know as to the selling of the shares. I am told that they were offered under par and nobody would buy them. I do not know that I anticipate another coal famine. I never anticipated the last one; I wish I had.

Re-examined by Mr. LITTLER: It is my view, having regard to the present condition of the coal market, that if this company is to raise the necessary capital to carry out its works rightly, it must have that which it seeks from Parliament. Not that they would necessarily charge the maximum price, because the Gas-Works Clauses Act compels them not to do so. I do not know of anything, except it be another coal famine, to cause them again to raise the price to the consumers.

This concluded the case for the promoters.

Mr. RICHARDS, in addressing the committee for the petitioners, said that the case, as put before the committee, was that the price of gas should be raised on account of the increase in the price of coal. He contended that the promoters had not made out their case for that which they asked of the committee. The petitioners believed that the rise which had taken place in the price of coal may be considered to be past. He did not know that the price of coal would ever be as low again as it was in 1866 or 1867, but everybody knew that the price of coal had for the last few months been gradually going down, and the time had passed when the company could come before the committee on that ground. It appeared to him that, although the promoters had put before the committee a very hard case, which prevented them from paying a dividend, yet they were able to show a balance of £3321 9s. 9d.

The CHAIRMAN: That was brought forward from previous years.

Mr. RICHARDS: But there stood the balance; how was it, then, that they were not able to divide any dividend?

The CHAIRMAN: They had made in some years 8½ per cent., and, with the consent of the shareholders, they divided 7, and put back the balance to provide working capital.

Mr. RICHARDS said that might account for it; but they were coming to ask for an increase in the price of gas, when coal was returning to its normal price, which request seemed rather unreasonable. He did not say that the company had not suffered in past years; but if they had, and required help, they ought not to ask for so much. They said they wanted 5s. 5d. (how they resisted the temptation to make it 5s. 6d. he could not tell), but they were content, or said they would be content, with 5s. 5d. Suppose the price should be raised from 4s. 3d. to 5s. 5d., then the company would make very large profits indeed, compared with anything they had previously made. The company had only divided 5, 7, or 8 per cent., something short of the 10 per cent. to which they were entitled on their own capital; but by the operation of the Act of 1847, if there was a surplus over their maximum rate of dividend, they were at liberty to pay any back dividends which they might have paid short. If the company were permitted to have such a large increase as that which they were seeking, they would make such a fortune that they would be able to pay their back dividends to the year 1866. He represented a public body, not animated in the slightest degree by any hostile feeling. The corporation had a duty to perform to the public, and the committee were sitting as arbitrators between them and the company; and he submitted that no such case had been made out as warranted the company in asking such a high price at the hands of the committee. One feature of the bill was the application for fresh capital. The capital the company had in 1866 was £20,000, with a borrowing power of £5000. Of that they had raised £12,000, and £12,000 only; so that from 1866, when they obtained their bill, to March, 1875, they had expended upon capital account only £12,000, and they had £8000 remaining. But if £12,000 had lasted for nine years, £8000, the sum remaining, would surely last for six years more, or ought to do so. Mr. Stevenson had said they wanted more money in order to develop their works.

The CHAIRMAN: Not only to develop, but in order to be able properly to make their gas, which they had not been able to do up to this time.

Mr. RICHARDS said, in point of fact, it was evident that the works did not do what they ought to do. Colchester was described as a tolerably thriving place; and it was necessary that there should be an increase of expenditure upon capital account, an increase of plant, and so on; yet for nine years the capital account had remained the same. How was it possible to account for that? He accounted for it by their improper and injudicious management. When the wear and tear account was looked into, it was found to be much larger than it should have been. They had, in point of fact, expended money upon capital account which belonged to revenue, which ought not to have been done. Whatever might be done by the committee as to the price allowed for gas, the reduction of 1s. 8d. allowed by the company to the corporation for the public lamps ought certainly to remain. The amount of 17s. asked by the company for lighting and cleaning those lamps was much too high, and should remain at 13s. The company based their price of gas upon the high price of coal, which was a thing of the past, and certainly did not exist now; therefore the price they asked seemed to him preposterous. Of course the company came to make the most of their case. He did not propose to call any witnesses. The conflict of engineers was a thing with which all were tolerably familiar, and he need not say that, if he had chosen so to do, he could have called engineers who would prove the contrary to what had been proved by those called on the other side. Knowing how familiar some of the members of the committee were with the subject, he left the matter with every confidence in their hands. If the decision was against the corporation, he could not say that he should be content with it, but he should console himself with the old adage:—"Thank God there is a House of Lords."

The room was cleared for the consideration of the committee, and on the readmission of the parties,

The CHAIRMAN said that the committee had very carefully considered the case, and they found that four questions arose. First, as to whether they would allow any, and, if any, what additional price to be charged as the maximum price of gas. Considering all the circumstances, that coal had risen since the agreement between the parties was made, although the price was not so high now as it was two years ago, yet the committee thought that an increase would be reasonable. They did not propose to grant the amount of increase asked for, but would fix the maximum price at 5s., which was an increase of 9d. instead of 1s. 2d. as asked. The next question was one with regard to the price to be charged to the Corporation of Colchester. Upon that point the committee considered that the corporation should be placed in the position of the most favoured consumer, and only in that position, excluding the Ordnance and Barrack Department, for the reason that had been stated by one of the witnesses—namely, that their position was so different to that of any other consumer, that they paid for the gas straight out of the main, and, therefore, paid for the loss. The committee, therefore, excluded them, and held that the price to be paid by the town of Colchester should be the lowest price charged to any private consumer, but that the Ordnance and Barrack Department should not be deemed private consumers. The third point was that, considering the general increase of prices, there was some reason for an increased charge for lighting and cleaning the public lamps. The committee did not consider that it was necessary to allow as much as had been asked for, and they would, therefore, fix the maximum price at 15s. instead of 13s., and as against 17s., the price asked by the company. The fourth point was, whether the increase of capital was to be allowed or not. The committee shared the opinion which had been expressed by himself, that the directors of the company appeared to have been too saving of their capital account; and, under those circumstances, it was obvious that a large amount of expenditure was necessary. The committee, therefore, thought that, looking to the affairs of the company, the amount of £10,000 which was asked for was a reasonable amount for the next ten years. Subject to those points, the committee considered that the preamble of the bill was proved.

COURT OF REFEREES.—MONDAY, MARCH 22.

(*Before Sir* JOHN ST. AUBYN, *Chairman; Mr.* PEMBERTON, *Mr.* RICKARDS, *and Sir* JOHN DUCKWORTH.)

BIRMINGHAM AND STAFFORDSHIRE GAS BILL.

The further inquiry into the *locus standi* of the several petitioners against this bill, whose cases were not disposed of the week previously, was now resumed.

Mr. ASPINALL, Q.C., who appeared for the Great Western and North-Western Railway Companies, supported their petitions, and contended that they had a distinct right to come before that court and obtain leave to oppose the bill. They were very large consumers of gas in Birmingham in respect to their stations and other works, and he submitted that, although they were only two ratepayers, their interest was so great that they were quite as much entitled to representation as the other Birmingham consumers whose claims had been admitted on Friday. They paid large sums to the corporation—about £10,000 per annum—and were large consumers of gas besides; and considering that, under the circumstances of this bill, they were not represented by the corporation, he did think it was only right that they should be allowed to be heard. Probably the court would find that, although they were only two, they paid collectively a larger sum to the borough funds than was paid altogether by the larger number of petitioners whose claims had been admitted; and even were it otherwise, it appeared to him that they were entitled to be heard as quite an exceptional class of ratepayers, and as entitled to show, if they could, that the proposed agreement between the corporation and the gas company was not an advantageous one for the consumers, and should not be further proceeded with. At present the railway companies were entitled to an exemption of their value on any rate for supplying the borough of Birmingham with gas, whereas the present bill would affect them very considerably. The ground of objection to the *locus standi* was that, under the bill, no property would be taken or interfered with; but he must mention that it would affect their exemption, to which he had just referred. Furthermore, not only were the corporation going to pay the gas company the full amount of profit, but they were going to take other liabilities besides.

Mr. RICKARDS said the promoters held that the purchase would have the effect of lessening the rates; the railway companies seemed to doubt that, and contended an improvident bargain was being made, and that they, or any ratepayers, would be entitled to be heard.

Mr. ASPINALL said the corporation were going to incur this charge specially for the benefit of those inhabitants of Birmingham who moved about its streets; but it was not for the benefit of such consumers as his clients, and he held, therefore, that he had a right to argue against it. The charge became one which might result in an increase of a rate of which his clients had to pay the whole, instead of having the exemption which they at present enjoyed. The borough rate might be very largely increased, and the corporation might have to do for nothing that which the gas company had hitherto done at a profit. These things were not generally managed well by corporations, and if there was a loss it must fall upon the borough rate, and through that on the petitioners. It was said, in answer to the petition, that it would result in no increased charge on the rates; but that it might become so was proved by the clause giving power to defray the charges out of such a rate, and therefore he considered that the gas company viewed that as a contingency, and secured themselves accordingly from any loss which might arise from the speculation, as he should call it, of the Corporation of Birmingham. It would be a great injustice if the companies were prevented from going before a committee of either House of Parliament to set forth what they now urged. At present the Corporation of Birmingham, though they had power to purchase gas-works, had no power to charge the cost upon a fund to which his clients contributed, but from which they received no substantial benefit. If the Houses of Parliament considered that the railway companies did not receive the same benefit as other persons from the sewage regulations, then he considered they would, in all probability, hold they were entitled to similar exemptions in the present case.

Mr. LITTLER, in reply on behalf of the gas company, contended that the improvement which, under the new powers, must be made in the lighting of the streets, was not without benefit to the petitioners now being heard. There was going to be no alteration in the incidence of taxation here; no new rate was to be made.

Mr. RICKARDS: There is a clause authorizing one.

Mr. LITTLER did not consider that even then the present petitioners were in a different position from other consumers of gas. Assuming a deficiency to be

provided for out of the borough rate, then, as consumers, they were benefited, because they were getting their gas cheaper than otherwise they would have it. As ratepayers they could not aver that they were distinct from other ratepayers. The present bill did nothing more than simplify existing law, because under the Municipal Act the borough rate was liable for all things done by the acts of the corporation. For instance, if a creditor obtained a judgment which could not be met by the improvement-rate, because of its maximum of 2s. being exhausted, he might recover from the borough fund. Consumers under such a case might have a word to say, but he did not think railway companies were in a different position to other consumers; and as the ratepayers, of whom they were a part, had sanctioned the action of the corporation, their mouths were shut. The petitioners had not attended at the meeting as dissenting ratepayers, and he did not see, therefore, how they could be heard now. There were certain matters in which the railway companies in the town were exempted, but in regard to the present question they were only in the position of ratepayers. They shared the responsibility with other ratepayers either of profit or loss, and he did not see that they were different to other ratepayers. He did not see why their railway stations would not be benefited as well as other places. The railway companies were not only seeking an exemption from new grievances, but were seeking to be made exempt from an Act of Parliament already passed, in regard to their liability to the borough rate. At present the promoters were simply seeking to carry out an agreement which had been previously made, and which he did not see that the petition had any power to prevent them carrying out.

Mr. MICHAEL was then heard on behalf of the corporation, contending that the railway companies were raising a purely imaginary grievance, inasmuch as they had assigned no reason why the corporation were likely to lose by the transaction, and therefore become liable. Theirs was merely a contingent liability, and a profit was much more probable than a loss, and in a profit the companies as consumers would most certainly participate. He failed to see the difference between the railway companies and other consumers, for their exemption was confirmed, inasmuch as any loss would be charged upon the improvement, and not on the borough rate.

Mr. ASPINALL said that, under the Improvement Act of 1872, the charge would fall on the borough rate, to which the railway company would be called on to contribute.

Mr. MICHAEL differed from Mr. Aspinall on both charges, and held that he was quite correct in his facts.

The referees then retired, but shortly afterwards returned to ask whether the Midland Railway Company would abide by the decision in the case of the petitioners then before the court.

It having been mentioned that the Midland would agree to do so,

The CHAIRMAN said the court had decided to disallow the claim to *locus standi* of all three companies, and the Birmingham Canal Company having decided to abide by such decision, their claim would also be disallowed.

BIRMINGHAM GAS COMPANIES (NOS. 1 AND 2) BILLS.

In this case Mr. PEMBROKE STEPHENS appeared on behalf of the consumers of gas in Birmingham, and supported their petition for *locus standi*.

Mr. RICHARDS pointed out that these were amalgamation bills, and the position of the petitioners was altered, inasmuch as the corporation were really supporting the propositions set forth by the petitioners. Here the consumers were dealing with an amalgamation bill, and every objection they had was being dealt with by the local body under which they lived.

The *locus standi* was allowed.

Mr. CLERK, Q.C., then addressed the court on behalf of the Walsall Improvement Commissioners.

Mr. RICHARDS, Q.C., was heard on behalf of the corporation, and contended that the condition of the commissioners of Walsall with respect to the amalgamated companies was not a whit the worse than it was when dealt with by the one company.

The *locus standi* was allowed.

BIRMINGHAM (CORPORATION) GAS BILL.

The petitions for *locus standi* were in this bill made subject to the decisions in the previous case, with respect to local board and consumers.

BIRMINGHAM (CORPORATION) WATER BILL.

In this case, Mr. JOHN CLERK, Q.C., who appeared for the local boards of the parishes of Aston and Handsworth, claimed that they should be heard in the matter, inasmuch as they would be prejudiced by the transfer of the supply of water from the present company to the Corporation of Birmingham, a body quite independent of the local board.

Mr. MICHAEL argued on behalf of the corporation that the transfer was simply a change of masters, and could not materially affect the petitioners.

The COURT declared the *locus standi* allowed.

Mr. ASPINALL, Q.C., was then heard for, and Mr. MICHAEL against, the claims of the London and North-Western, Great Western, and Midland Railway Companies; and these, as also that of the Birmingham Canal Navigation Company, were disallowed.

PRESTON WATER-WORKS.—On the 16th inst., Mr. Morgan, C.E., opened an inquiry at Preston relative to an application to the Local Government Board for sanction to borrow £40,000 for the works of water supply. The inspector stated that at the meeting of the corporation in July last it was resolved—"That application be made to the Local Government Board for their consent to borrow a further sum of 40,000 for the execution of the water-works." This application was sent to the Local Government Board, with details of the particulars as to the money expended on the new water-works for obtaining a supply of water from the Langden and Hareden Brooks, and also for executing certain water-mills within the borough for giving a supply of water at a higher pressure to several portions of the town where it had been considered desirable. Mr. Gilbertson, in reply, stated that since the application was made for the £40,000, the figures had been gone over, and the increased cost of labour and other unforeseen matters had raised the sum total of the estimate to about £1000 above the amount named in the application. Mr. Morgan inquired whether there was any resolution of the council empowering the application for the increased estimate. Mr. Gilbertson said that there was not. The figures had somewhat changed since the application was made. Of the money applied for, £26,000 had already been expended, it being necessary to proceed with the works. Mr. Morgan then read his report, which was presented to the Local Government Board on March 31, 1871, when application was made to borrow £50,000. Mr. Carter, in answer to a question by Mr. Morgan, said that the rateable value of the borough was £240,407; the existing debt was £358,126 2s. 3d., leaving an available margin of £122,288. A statement of the different sums of money borrowed from the Public Works Loan Commissioners in public improvements relating to the parks, cattle market, &c., was submitted to the inspector, who took notes of the various items of information presented to him for presentation to the Local Government Board. Mr. Morgan further inquired whether the gentlemen present would adhere to the application for £40,000 which was confirmed by the resolution of the council, or whether they would wait and get the sanction of the council to the borrowing of the increased sum spoken of. Mr. Gilbertson said that as the money was required at once, they would at present content themselves with the application for £40,000. Mr. Morgan, after hearing the statements made, said that he would be very happy to recommend the Local Government Board to make an order for the borrowing of the money applied for.

Legal Intelligence.

COURT OF CHANCERY.—TUESDAY, MARCH 23.

(*Before Vice-Chancellor Sir* C. HALL.)

THE ATTORNEY-GENERAL *v.* THE MAYOR, ALDERMEN, AND BURGESSES OF DARLINGTON.

Mr. LINDLEY, Q.C., and Mr. CROSSLEY were for the Attorney-General and the plaintiff; Mr. DICKINSON, Q.C., and Mr. HUMPHRY were for the defendants.

This was a suit instituted by the Attorney-General as informant, at the relation of Mr. Anthony Strong, the plaintiff, of Tees View Villa, Croft, in the county of Durham, to restrain the defendants, the Corporation of Darlington (and who are also the Urban Sanitary Authority of that borough) from polluting the river Skerne by their sewage operations, to the injury and annoyance of the plaintiff and the public, inhabitants of Darlington. The river Skerne flows by the north-east of that place, and thence onwards, in a south-westerly direction, to Houghton-le-Skerne, adjoining the borough of Darlington. The plaintiff's case mainly was that, in consequence of the stenches, vapours, and gases produced by the sanitary works of the defendants, he and his wife had been compelled, in July, 1874, to leave his house and go away from the neighbourhood. The cause now came on upon a motion for an injunction to restrain the alleged pollution of the river and its tributaries by the defendants works, and to compel them not to allow any mud or other noxious matter to remain in the river or its approaches; in other words, to remove the mud and matter.

The VICE-CHANCELLOR granted an injunction in the terms of the notice of motion, omitting the mandatory part of it, but ordered the injunction not to be enforced till the last seal day but one before the long vacation, with liberty to each party to apply to the court in the meantime as they might be advised.

NEWENT PETTY SESSIONS.—MONDAY, MARCH 15.

(*Before Mr.* R. F. ONSLOW, *Chairman; and Messrs.* THACKWELL *and* RICARDO.)

CONVICTION OF A GAS COMPANY AND A DIRECTOR FOR BREACHES OF THE COMPANIES ACT.

The Newent Gaslight and Coke Company were summoned "for that they, being a company subject to and under the Companies Act, 1862, and having a capital divided into shares, did unlawfully make default in complying with the provisions of the said Act with respect to forwarding such list of members or summary as is mentioned in the 26th section of the said Act to the Registrar of Joint-Stock Companies, and continued such default for the space of 160 days up to and including the 25th day of February, 1875, contrary to sections 26 and 27 of the said Act;" and Mr. *Edmund Edmonds* was summoned "for that, being director manager of the Newent Gaslight and Coke Company, subject to and under the Companies Act, 1862, and having a capital divided into shares, he did unlawfully make default in complying with the provisions of the said Act, in respect to forwarding such list of members and summary as is mentioned in the 26th section of the said Act, to the Registrar of the Joint-Stock Companies, and continued such default for the space of 160 days up to and including the 25th day of February, 1875, unlawfully and knowingly did authorize or permit such default and contravention of the said Act, contrary to sections 26 and 27 of the said Act."

Mr. WHITTING (Messrs. Bevan and Whitting, 6, Old Jewry, London) appeared in support of the summonses, and Mr. STROUD, of Cheltenham, appeared for the defendants.

Mr. STROUD objected to the jurisdiction of the magistrates; but the objection was overruled.

Mr. *Richard Shyer* was the first witness. He said: I am chief clerk to the Registrar of Joint-Stock Companies, London; I produce the file of proceedings of the Newent Gaslight and Coke Company. The company was completely registered on the 2nd of May, 1851, and subsequently incorporated under the Joint-Stock Companies Act on the 10th of November, 1856. The company has its registered office at Newent, in the county of Gloucester. The company made returns under the Act of 1862, in October, 1863; in November, 1864, for that year; also in 1865, 1866, 1867, and 1868; from that time to the 25th of February no returns have been made; returns were made for the years 1869-70, 71-2-3-4, on the 11th of March, 1875; the nominal capital of the company is £1250, divided into 250 shares of £5 each. The number taken up is 240; of these Mr. Edmund Edmonds holds 195. In the schedule to the deed of settlement under the Act of 1844, Mr. Edmonds's name appears as an officer and director.

Mr. *Trotman Foster*, of 21, John Street, Adelphi, London, gas coal and cannel merchant, said: I trade with my brother as Edwin Foster and Co., and I am informant in this case. In 1874 I supplied a truck of coal to the Newent Gas Company; it was about eight tons. I rendered the invoice, and applied for payment for the coal. The application was in writing. I have never applied personally for the amount, and it has not been paid to me. In consequence of non-payment, I applied at the Westminster County Court for a summons, but I did not get it. In consequence of a doubt as to the existence of the gas company, I went to the Joint-Stock Registry to search the file of proceedings. I found nothing registered there since 1868, and I therefore believed the company had ceased to exist. I received a letter from Mr. Edmonds; it was as follows:—"Newent, Gloucestershire, Jan. 25, 1875.—Sir, I have been served with a county court summons at your suit, and am at a loss to understand why you should have issued it. Perhaps you will state the reason; otherwise I shall at once instruct an attorney to defend it." The result of my search at the Joint-Stock Registry Office was that I proceeded with the summons against Mr. Edmonds. The case came on in the county court on the 24th of February; I was non-suited. I was not present at the hearing at the county court. I have paid the costs of being non-suited. I have incurred expenses amounting to £27 and upwards.

Mr. STROUD: According to my view, he has been ill advised to take some absurd proceedings. What have we to do with that? If he has had to pay costs of attorney or some one or other what have we to do with that?

Witness: I have paid £27 and upwards for costs, besides the loss of my own time. I lost a great deal of time in consequence of the county court proceedings. On the 24th of February I searched the proceedings of the Joint-Stock Registry, and again on the 25th with my solicitor, and found no returns since 1868.

This was the case for the prosecution.

Mr. STROUD asked whether the evidence was intended to apply to one or to both of the summonses.

Mr. WHITTING replied that the evidence applied to both summonses.

Mr. STROUD remarked that the only difference between Mr. Edmonds's case and that of the company was the question whether he had been a director, which he (Mr. Stroud) did not know had been proved, and if he was a director, whether he knowingly and wilfully authorized the default. He contended that the Act under which these proceedings had been taken did not apply to this particular company. The company was formed under the statute of 1844. The Act under which the proceedings were taken embraced the Acts, of 1856-7, but did not include the Act passed in 1844. Section 26 of the present Act stated that "this Act shall apply to companies formerly registered under the Joint-Stock Companies Act." That was the section on which the prosecution relied for the purpose of showing that the defendants were within the penal clauses of this particular Act. There had been no formation of the company under the Act of 1856 or 1862; the company was formed long anterior to the legislation to which he had referred. Would it not be a monstrous thing that a company formed as this had been under the Act of 1844 should be liable to such penal clauses? The company had simply been registered under the Act of 1856. Could any gentleman, exer-

ciating a judicial mind, say that this company was formed and registered under the Act of 1862, or any other of the Acts of the joint-stock companies? Returns had been made, he admitted, but that did not constitute evidence against the company. There might have been a doubt in the minds of the company as to whether returns ought to be sent, but that was not the question; the question was whether the company had committed an offence. Another point he submitted with a great degree of confidence was that if an offence had been committed the time within which information of this offence ought to have been laid had passed, and consequently the magistrates could not deal with it. Under Jarvis's Act, information of an offence must be laid within six months of the time of its commission; and that had been acknowledged by the form of the summons; there could no doubt upon that point, he believed. The next point was this: The Act said that "every company under this Act, and having a capital divided into shares, shall make once at least every year a list of all persons who on the 14th day succeeding the day on which the ordinary general meeting (or if there is more than one ordinary meeting in each year, the first of such ordinary general meetings) is held are members of the company." There had not been a single solitary tittle of evidence to-day to show when the ordinary meeting of the company was held.

Mr. WHITTING said that the extract from the company's deed showed that the meeting of shareholders ought to be held on the last Thursday but one in the months of March and September every year. That was also in conformity with the Companies Act of 1862.

Mr. STROUD contended that that did not tell the court when the meeting was held. The meetings might have been adjourned.

Mr. WHITTING: Then produce your minute-book.

Mr. STROUD: I will not produce the minute-book.

Mr. WHITTING: I say it is a monstrous thing to get up and use such an argument as this. I submit that the bench will not hear such an argument until he produce his minute-book.

Mr. RICARDO said the defendants had had notice to produce it.

Mr. STROUD maintened that the defendant was not obliged to give evidence as against himself. If the defendant did not produce his book, the burden of proof was on the side of the prosecution, by secondary evidence or otherwise. It was perfectly easy to prove when the meeting was held.

Mr. WHITTING said he had just been informed that one of the members was dead; therefore Mr. Foster's county court summons was strictly in order; because, according to the 48th section of the Act, if a company ceased to have seven members, each member of the company should be personally liable for the debts contracted by the company. Therefore it showed how fallacious were the returns made to the Joint-Stock Registry, because a dead man could not be a member of the company. He would call evidence to prove the fact, if necessary.

Mr. STROUD, in reply to the chairman, said: I have not the minute-book, and do not produce it. I repeat my objection to your jurisdiction, that the offence took place in London, and not here; that if the company had been formed and registered under the Act of 1856, the information has not been laid within the time in which Jarvis's Act says it should be; and that the mere continuation cannot be taken advantage of without the principle upon which the continuation has to hang; that there has been no proof whatever of the holding of the general meeting; and that accordingly there can be no judicial determination by this court to say that we are in default, because they have not proved one of the very essentials of the offence. How was Mr. Foster damnified by the non-delivery of the accounts.

The CLERK: It is not necessary to show injury.

Mr. STROUD then stated that should the bench be against him, he should have to address them briefly as to the amount of the penalty. There was simply a truck of coal in the transaction.

Mr. WHITTING: Then the more's the shame it was not paid for.

Mr. STROUD said the payment was offered, but Mr. Foster was determined to go on against Mr. Edmonds.

Plaintiff: The money was offered after all expenses had been incurred.

Mr. STROUD: He was badly advised all through.

Mr. RICARDO: Was he offered the money before he incurred the expense of £27?

Mr. STROUD: I do not know. He was badly advised in going against Mr. Edmonds.

Plaintiff said he was told by his banker that Mr. Edmonds was proprietor of the gas-works.

Mr. STROUD said if the bench considered it was a case upon which they could at all act, they knew what the nature of the undertaking was. There was nothing in the nature of a heinous offence in this case. The works seemed to have fallen into disuetude, and the people used oil instead of gas. Nobody had been at all damnified, and these proceedings were monstrous.

Mr. WHITTING, in reply, said, with regard to the question of jurisdiction, he thought that had been disposed of at starting. The company were really and completely registered under the Act of 1844; but the moment it became incorporated with the Act of 1856, it was bound under that Act, and the Act of 1844 had nothing more to do with it. The question as to its being a continuing offence seemed to him to be hardly arguable. There were authorities on the subject. Nobody could take advantage of their own wrong. Apart from the minute-book, he should, of course, assume that the company did concur in the provisions of its own deed, and the expressed provisions of the Act of Parliament, but whether they did or did not, they could not take advantage of their own wrong. With regard to the case against Mr. Edmonds, the only observation he had to make was that it was "for unlawfully and knowingly" doing it. He again claimed production of the minute-book to show that.

The CHAIRMAN: It is a pity it is not here.

Mr. STROUD: It is no pity at all; I am well advised with regard to that.

Mr. WHITTING said that it had been proved by the proceedings since the incorporation of the company in 1856 that Mr. Edmonds was director. The minute-book was not produced, and that would conclusively prove whether he was or was not. In the face of that it was impossible for the other side to deny that he was not a director. Assuming, therefore, that the bench would be of opinion that Mr. Edmonds was a director, the only difference between the two summonses was that Mr. Edmonds was charged with unlawfully and knowingly permitting the default to be incurred. The director of a public company was bound to read the Companies Act of 1862, and to know the law. It was presumed that all were bound to know the law, and *a fortiori* a director was bound to know the Companies Act when assuming control of a public company.

Mr. STROUD submitted that there was no proof at all of Mr. Edmonds being a director at any period over which this offence was charged. It was nothing to do with it that he was in 1856 or 1844, or any other time. It must be proved that he was a director at the time mentioned in the summons—namely, 160 days prior to the 25th of February. The secretary was in court, and the prosecution could ask him the question if they pleased. There was not a tittle of evidence that Mr. Edmonds knew anything about this, or to connect him in any way with the transaction.

Mr. WHITTING drew the attention of the court to the following letter, received from the defendant's solicitors:—"Sir,—I hereby give notice that the defendant in this case will admit the non-registration of the list of shareholders of the Newent Gas Company on the hearing of this case before the magistrates at Newent on Monday next."

Mr. STROUD remarked that Mr. Edmonds, finding upon inquiry that the list of shareholders had not been registered, he was not prepared to dispute it; but that letter did not say that Mr. Edmonds knowingly and wilfully permitted it.

After some further argument the magistrates retired, and were absent a short time. On returning into court,

The CHAIRMAN said: We have done the best we can in this case, and are unanimously of opinion that the company are liable for not having done what they ought to have done, and also that Mr. Edmonds, as a director, is also liable for having permitted that neglect to exist.

Mr. STROUD and Mr. WHITTING then addressed the bench upon the question of penalty.

After having again retired to consult, the magistrates re-entered the court, and

The CHAIRMAN said: We fine the company £10, and the director £30, and we direct the whole of the penalty to go to the informant.

Mr. STROUD applied for a case for the Court of Queen's Bench, which was granted.

Miscellaneous News.

CHESTERFIELD WATER-WORKS AND GASLIGHT COMPANY.

The Ordinary Meeting of Shareholders was held on the 9th inst., at which the following report of the directors was presented:—

The usual abstract of the accounts for the half year will be found on the next pages, and the directors propose the declaration of dividends after the same rate as those for the preceding half year. The annexed account No. 5 shows the details.

The price of coal, although considerably less than in 1873, is still high, and materially affects the profits of the company. Notwithstanding this, the net profits from both gas and water in 1874 exceed those of 1873 by £1052 16s. 6d., while the increased charge for interest and dividends in 1874 over 1873 has been £992 19s. 3d.

The new capital, the interest and dividends on which form nearly the whole of the above £992 19s. 3d., has been mainly expended in the new gas-works, which, not having been yet in operation, are necessarily unproductive of revenue.

Hitherto the board have had to conduct the entire traffic of the gas-works, both inwards and outwards, by carts, and the want of railway facilities has long been felt. The directors are now enabled to state that the gas-works will shortly be placed in communication with the Midland Railway system. The connecting branch line is being made free of all cost to this company, and the board consider the advantages to be thus obtained of considerable importance. The company's coal and coke traffic, already large, is steadily increasing, and the having to conduct it by horses and carts was becoming a question of means as well as of cost.

Messrs. Lancaster and Burkitt are the retiring directors, and Mr. Cowley is the retiring auditor—all are eligible for re-election.

The manager (Mr. C. E. Jones) made the following report:—

Gentlemen,—Herewith I beg to hand you report of the illuminating power and purity of the gas supplied to the public during the half year ending Dec. 31, 1874, by which you will perceive the requirement of the company's Act of Parliament, that the illuminating power shall not be less than "15 candles," has been fully satisfied, and considerably more than the statutory standard of light maintained.

The average illuminating power, when corrected to the standard temperature and pressure, has been equal to 17·34 candles.

The amount of "sulphur" per 100 cubic feet has averaged 10·56 grains.

The ammonia amounted to 3·27 grains per 100 cubic feet, and this small quantity I hope still further to reduce.

Sulphuretted hydrogen, the most common and objectionable form of impurity, has been invariably absent, which satisfactory result I have been able to secure by supplementing the old purifying power by the use of oxide of iron.

I have also appended a statement of the statutory illuminating power of the two largest London companies (who use precisely similar apparatus for the examination of the gas), together with the maximum amount of "sulphur" and ammonia at present allowed by the metropolitan gas referees, whose appointment is made by the Board of Trade, and whose duty it is to certify the amount of impurity to be from time to time allowed in the gas supplied to the metropolis, and I venture to conclude that you will consider the comparison by no means unfavourable.

Statement showing the Illuminating Power and Purity of the Gas supplied to the Public during the Half Year ending Dec. 31, 1874.

Tested by the Board of Trade "Standard" Apparatus.	Illuminating Power in Standard Candles.	Grains of "Sulphur" per 100 Cubic Feet.	Grains of Ammonia in 100 Cubic Feet.	Sulphuretted Hydrogen.
July	16·21	..	..	No trace.
August	18·26	10·43	2·68	,,
September	16·90	10·69	2·63	,,
October	16·57	11·44	No test. Tube broken	,,
November	18·18	9·86	3·07	,,
December	17·93	10·38	4·73	,,
Average of testings for the half year	17·34	10·56	3·27	,,
Illuminating power required by Act of Parliament	15·00	..	..	..
Statutory illuminating power of The Gaslight and Coke Company's gas, and amount of impurity allowed	16·00	20 grains.	2·5 grains.	None.
Ditto ditto Imperial Company's gas	14·00	25* ,,	2·5† ,,	,,

* This was formerly 30 grs. † Till recently the maximum of ammonia was 5 grs.

CRYSTAL PALACE DISTRICT GAS COMPANY.

The Ordinary Half-Yearly General Meeting of this Company was held on Thursday last at the London Tavern—ERASMUS WILSON, Esq., F.R.S., in the chair.

The SECRETARY (Mr. Magnus Ohren) read the notice convening the meeting, and the following report and statements of account were submitted:—

The directors have to report that the general working of the company has been satisfactory during the half year; but that, owing to the large stock of coke on the 30th of June last, the low price realized for coke this half year, and coal being at a high price, the profits will not allow of the usual charges for works renewal and mains renewal accounts, and it will be seen that portions thereof have been carried to contingent-fund.

The directors have further to report that they have not found it necessary to raise the price of gas to the general consumers; that they are now supplying it at a maximum of 4s. 2d. and a minimum of 4s., with public lamps at 3s. 7d., and have continued to supply at these prices during all the fluctuations in the price of coal.

The directors report that Dr. Marris Wilson, one of their body, in consequence of long-continued illness, having placed his resignation in their hands, it was accepted by them with regret.

The directors have elected Mr. George T. Livesey to fill the vacant seat at the board, an election which they feel will meet with the approval of the shareholders.

The directors going out of office by rotation are Mr. Frederic L. Linging and Mr. C. Lea Wilson, who, being eligible, offer themselves for re-election.

The auditor going out of office by rotation is Mr. John Gray, who, being eligible, offers himself for re-election.

The reports of the chemical adviser of the company and of the medical officers of the parishes supplied by the company, on the illuminating power of the gas, and its freedom from sulphuretted hydrogen and ammonia, continue to be satisfactory. During the half year fourteen visits have been made to the new testing station by Dr. Letheby on the part of the company, and Dr. M'Cormack and Mr. Heisch on behalf of the parishes of Lambeth and Lewisham respectively; and the average result of these examinations of the gas has given an illuminating power of 14·68 standard sperm candles.

The accounts annexed show the financial position of the company. The balance of profit and loss account amounts to £9124 18s. 11d. Out of this sum the directors recommend the declaration of a dividend at the rate of 6 per cent. per annum on the preference capital; a dividend at the rate of 7 per cent. per annum on the ordinary 7 per cent. capital; a dividend at the rate of 10 per cent. per annum on the original capital; a dividend at the rate of 7 per cent. per annum on the converted 7 per cent. capital; and a dividend at the rate of 10 per cent. per annum on the converted 10 per cent. capital; all free of income-tax; which will absorb £7973 1s. 1d., and leave £1151 17s. 10d. to be carried forward to the profit of the succeeding half year.

A.—STATEMENT OF SHARE AND LOAN CAPITAL.

Acts of Parliament regulating the Capital of the Company.	Description of Capital.	Maximum Dividend authorized.	Number of Shares issued.	Nominal Amount of Shares.	Called up per Share.	Total paid up.	Amount unpaid or unissued.	Total Amounts authorized.
21 & 22 Vict., cap. 192	Ordinary.	10 per cent.	5,000	£10 0 0	£10 0 0	£50,000	..	£50,000
Ditto ditto	Preference.	6 ditto.	5,000	10 0 0	10 0 0	50,000	..	50,000
Ditto ditto	Converted.	10 ditto.	2,500	10 0 0	2 0 0	5,000	..	25,000
Ditto ditto	Loans.	..	..	..	..	1,000	..	..
28 Vict., cap. 32	Ordinary.	7 per cent.	10,000	10 0 0	10 0 0	100,000	..	100,000
Ditto ditto	Converted.	ditto.	2,500	10 0 0	..	10,448	..	25,000
36 Vict., cap. 59	Ordinary.	ditto.	..	10 0 0	10 0 0	..	150,000	150,000
Ditto ditto	Loans.	..	..	..	..	..	37,500	37,500

B.—STATEMENT OF COALS USED DURING THE HALF YEAR.

Description of Coal.	In Store, June 30, 1874.	Received during Half Year.	Used during Half Year.	In Store, Dec. 31, 1874.
	Tons.	Tons.	Tons.	Tons.
Common	9,737	10,846	18,330	2,253
Cannel	660	..	150	510
Total	10,397	10,846	18,480	2,763

C.—STATEMENT OF RESIDUAL PRODUCTS MADE AND DISPOSED OF DURING THE HALF YEAR.

Description of Residual.		In Store, June 30, 1874.	Made during Half Year.	Used in Manufacture during Half Year.	Sold during Half Year.	In Store, Dec. 31, 1874.
Coke	chaldrons	5,273	18,480	3,757	1,107	1,889
Breeze	,,	310	909	..	819	406
Tar	gallons	3,946	175,789	..	133,525	46,250
Ammoniacal liquor	,,	19,446	388,080	378,826	..	28,700
Sulphate of ammonia	Tons	18	130	..	101	47

D.—CONTINGENT-FUND ACCOUNT.

Dr. *Cr.*

To Works renewal	£1,678 6 11	By Balance, June 30, 1874	£10,367 13 4
Mains renewal	762 0 11		
Balance, Dec. 31, 1874	7,927 5 6		
	£10,367 13 4		£10,367 13 4

E.—RESERVE-FUND ACCOUNT.

To Balance, Dec. 31, 1874	£1,139 3 1	By Balance, June 30, 1874	£1,136 18 5
		Interest on amount invested	2 4 8
	£1,139 3 1		£1,139 3 1

F.—INSURANCE-FUND ACCOUNT.

To Balance, Dec. 31, 1873	£481 2 5	By Balance, June 30, 1874	£365 11 11
		Revenue account	115 10 6
	£481 2 5		£481 2 5

G.—CAPITAL ACCOUNT.

	Expenditure, June 30, 1874.	Expended this Half Year.	Total to Dec. 31, 1874.		Certified Receipts to June 30, 1874.	Received during Half Year.	Total Receipts to Dec. 31, 1874.
To Expenditure to June 30, 1874	£199,097 10 8	..	£199,097 10 8	By Ordinary shares	£50,000 0 0	..	£50,000 0 0
Since June 30, 1874—				Preference shares	50,000 0 0	..	50,000 0 0
Buildings, manufacturing plant, storeage, and other structures connected with manufacture	..	£512 6 6		Ordinary 7 per cent. shares	100,000 0 0	..	100,000 0 0
New mains and service-pipes, including laying, paving, and other works connected with distribution	..	2,540 13 7		Converted 10 per cent. shares	5,000 0 0	..	5,000 0 0
Meters (additional), including fixing, also gas stoves and regulators	..	1,020 12 3		Ditto 7 per cent. shares	5,000 0 0	5,448 0 0	10,448 0 0
		£4,073 12 4		Loans £5,725 0 0			
Less—depreciation on meters		470 11 8		Less repaid 4,725 0 0			
			3,603 0 8		..	..	1,000 0 0
Total expenditure	..	..	£202,700 11 4				
Balance of capital account	..	..	13,747 8 8				
			£216,448 0 0				£216,448 0 0

H.—REVENUE ACCOUNT, *for the Half Year ended Dec.* 31, 1874.

Dr. *Cr.*

To Manufacture of gas—				By Sale of gas—		
1. Coals, including all expenses		£24,332 18 11		Michaelmas quarter—		
2. Purifying materials, wages, &c.		476 16 11		1. Private rental—		
3. Salaries of engineer and officers		525 10 0		4,251,700 cubic feet, at 4s.	£9,225 8 10	
4. Wages and gratuities		2,647 13 4		40,200,500 cubic feet, at 4s. 2d.		
5. Works, machines, and apparatus—maintenance of, repairs, and labour	£1,184 9 10			2. Public rental and under contracts	1,436 17 5	
Less old material sold	93 17 6					10,662 6 3
		1,090 12 4		Christmas quarter—		
5A. Retorts, renewal and repairs		269 1 1		3. Private rental—		
			£29,342 12 7	6,006,500 cubic feet, at 4s.	£20,549 17 9	
Distribution of gas—				39,873,200 cubic feet, at 4s. 2d.		
6. Salaries of chief inspector, inspectors, and clerks in light office		564 3 1		4. Public rental, and under contracts	1,685 7 5	
7. Mains and service-pipes, repairs, maintenance, renewal, and labour		327 13 4				22,235 5 2
8. Meters, repairing, renewing, and refixing		715 16 3		5. Meter-rental—the half year		523 14 0
			1,607 12 8			£33,421 5 5
Public lamps—				Residual products—		
9. Lighting and repairing			503 4 11	6. Coke, less labour and cartage	6,214 11 11	
Rents, rates, and taxes—				7. Breeze, ditto	169 1 0	
10. Rents		14 13 6		8. Tar, ditto	1,358 19 4	
11. Rates and taxes		1,225 15 8		9. Sulphate of ammonia and ammoniacal liquor, less labour, &c.	1,552 14 2	
			1,240 9 2	10. Sundries	225 16 10	
Management—						9,521 3 3
12. Directors allowances		500 0 0				
13. Salaries of secretary, accountant, clerks, and messenger		439 4 0				
14. Collectors commission		343 13 2				
15. Stationery and printing		195 5 9				
16. General establishment charges		482 17 3				
17. Auditors		30 0 0				
			1,991 0 2			
Sundries—						
18. Law charges			32 13 8			
19. Bad debts			134 0 8			
21. Insurance-fund (F)			115 10 6			
Total expenditure			34,967 4 4			
Balance carried to profit and loss account (J)			7,975 4 4			
			£42,942 8 8	Total receipts		£42,942 8 8

J.—PROFIT AND LOSS ACCOUNT (NET REVENUE), *for the Half Year ended Dec.* 31, 1874.

1. To Amount carried to reserved fund account (E), from profits of half year ending December, 1874				1. By Balance of net profit from last account	£9,070 17 0	
2. Interest on temporary loans	£17 5 3			Less dividend paid for the half year ended June 30, 1874.	7,847 17 1	
3. Interest on loans on bonds accrued to Dec. 31	110 15 11					£1,222 19 11
Balance of net profit to be carried to next account, subject to half year's dividends to Dec. 31	9,124 18 11			2. Balance brought from revenue account (H), being profit for the half year		7,975 4 4
				3. Interest on moneys deposited		54 15 10
		£9,253 0 1				£9,253 0 1

K.—GENERAL BALANCE-SHEET, *on Dec.* 31, 1874.

1. To Capital account (G), balance			£13,747 8 8	1. By Cash at bankers		£756 9 6
2. Profit and loss account (J), balance			9,124 18 11	2. Deposits at interest		2,009 12
3. Contingent-fund (D), balance			7,927 5 6	3. Reserve-fund invested (£1222 7s. 9d. Consols)		1,134 14 0
4. Reserve-fund (E), balance			1,139 3 1	By stock of		
5. Insurance-fund (F), balance			481 2 5	4. Coals	£3,954 3 2	
6. Unpaid dividends			108 0 6	Ditto on transit	458 4 6	
7. Sundry tradesmen and others, for amount due for coals, stores, &c., to Dec. 31, 1874:—				5. Coke and breeze	1,025 14 0	
Trade accounts	£2,988 15 0			6. Tar	481 15 5	
Bills payable	5,376 13 3			7. Sulphate of ammonia and ammoniacal liquor	989 5 4	
Petty cash	7 0 0			8. Sundry stores	5,115 4 7	
Deposits for gas	670 17 11					12,024 7 0
		9,043 6 2		8A. Retort account		618 17 8
				8B. Horses and carts		162 10 0
				By amount due for		
				9. Private gas and meter rental	20,729 6 10	
				10. Private arrears uncollected	74 19 7	
				11. Public rental and arrears	1,686 16 5	
						22,491 2 10
				12. Coke and other residuals		1,526 17 8
				13. Sundry accounts		846 14 3
		£41,571 5 3				£41,571 5 3

The CHAIRMAN moved—"That the report of the directors, and the balance-sheet confirmed by the auditors, be received, adopted, and entered on the minutes." In doing so he remarked that it would be gratifying to the shareholders to find that the directors had been able to continue the supply of gas at the same price as had been charged to the consumers for several years past, and this, too, in spite of the changes which had arisen from the scarcity of coal and the great cost of that material. Looking at the low rate of charge which the company had maintained, it would, indeed, be an unreasonable public who could, in this respect, make any objection to the company. The time might come when the directors would be able even to make a further reduction, and though the circumstances of the present moment did not enable them to calculate upon such a step as being near at hand, he could promise that when it was possible the directors would be found as heretofore good stewards in the interests of the public. Having done their duty in the past, they claimed a recognition of their services by the public, and they warned them that they had better not burn their fingers with parliamentary attempts to take upon themselves that which in their hands must necessarily be a dire loss. The last paragraph in the report showed that, besides doing their duty to the public, the directors were enabled to recommend the declaration of the usual dividend, and that without any important encroachment upon the contingent-fund. He said "important" because it was hardly to be expected that they could be so liberal as they had been when the price of coal was high, and that of coke low, as on former occasions, and, therefore, they had been obliged to have recourse to the contingent fund to make up the dividend as warranted by Act of Parliament. The directors, in their report, had the usual reference to the purity of the gas supplied, which, as would be seen, had been maintained very fairly. In consequence of some little unexpected fault which could not be anticipated, there had occasionally been a little more of the sulphur compounds present than could be desired, and he need hardly say that whenever this was the case they had always found the authorities ready to pounce down upon them. There was a feeling abroad that a gas company was a fair butt for the attacks of every one armed with a little power, who, whenever the occasion arose were not slow to use it. In conclusion, he had only to refer to the loss the company had sustained by the retirement of Dr. Marris Wilson, through illness. While the directors regretted this circumstance, they felt bound to congratulate the shareholders that they had been able to secure the services of a gentleman to fill the vacant office, whose name was thoroughly identified with the art and science of gas manufacture, and who was respected by all to whom he was known. Acting on the principle that whenever a vacancy occurred in the direction it should be filled up by the best man who could be found, he was sure the shareholders would feel much satisfaction in the appointment to the board of so distinguished a representative of gas industry as Mr. G. Livesey. With these remarks, he moved the adoption of the report.

Mr. H. P. STEPHENSON (deputy-chairman) seconded the motion, and said he should like to enlarge upon one point to which the chairman had only slightly alluded. He should be sorry that any misapprehension should arise in the minds of the shareholders as to the actual position of the company. There was a misapprehension out of doors that the company were able to pay their full parliamentary dividend, and carry over £1150. But this was not so. They brought forward a balance of about £1200; and, after paying the half year's parliamentary dividends, they did carry forward £1150; but a reference to the accounts would show that about £2500 of that which was generally carried as a charge to revenue, under the heads of "Works renewal" and "Mains renewal," had been charged on this occasion directly to the contingent-fund. The position of the company in this respect could be perfectly justified by the fact that they had gone through the coal crisis without raising the price of gas at all, whereas some of the London companies had been obliged to add as much as 1s. 3d. per 1000 to their charge. He had great hope that the necessity for again charging the items to which he had referred to the contingent-fund would not arise this half year.

The motion was put, and carried unanimously.

Mr. STEPHENSON moved, and Mr. LINGING seconded, the following motion, which was at once agreed to:—"That a dividend at the rate of 6 per cent. per annum on the preference capital, a dividend at the rate of 7 per cent. per annum on the ordinary 7 per cent. capital, a dividend at the rate of 7 per cent. per annum on the converted 7 per cent. capital, a dividend at the rate of 10 per cent. per annum on the original capital, and a dividend at the rate of 10 per cent. per annum on the converted 10 per cent. capital, all free of income-tax, be now declared, and be made payable forthwith."

Mr. OGG moved, and Mr. HOWSE seconded, the re-election of Mr. Linging as a director, which was carried.

Mr. BENGOUGH moved, and Mr. JOHN GRAY seconded, the re-election of Mr. C. LEA WILSON as a director, which was also carried.

Mr. LINGING returned thanks for himself and colleague.

Mr. WEBB moved, and Mr. BENGOUGH seconded, the re-election of Mr. John Gray as an auditor, which was agreed to.

Mr. ROBINSON proposed—"That the thanks of the meeting be given to the directors for their able management of the affairs of the company." In doing so, he congratulated the board that throughout a period of considerable difficulty and anxiety, owing to the high price of coal, they had been able to supply gas to their consumers at the moderate rates mentioned in the report. He expressed a hope that the contingent-fund might soon be restored to its normal condition, for he felt that, with so large a capital, £10,000 was by no means too large an amount to stand to the credit of that account. He submitted that it would be better for the shareholders to forego for a time a portion of their dividends if in that way only the fund could be restored.

The CHAIRMAN, in acknowledging the vote, which was cordially agreed to, referred to the last remarks of the mover, and said he was sure the directors would feel that only in a case of extreme exigency could they be justified in reducing the dividends below the rate now declared. Every man had a right to a fair interest on his capital, and when that capital was invested in an undertaking which presented in its very nature a certain amount of risk, he was clearly entitled to the utmost advantages derivable from it, so long as the sun shone upon its operations. He availed himself of this opportunity to refer to the admirable manner in which the auditors and officers of the company performed their respective duties, and concluded by moving a vote of thanks to them.

Mr. G. LIVESEY, in seconding the vote, said from his own personal knowledge he was fully aware of the amount of work and responsibility which devolved upon the principal officers of a company, and that the prosperity of the shareholders depended, to a great extent, upon their exertions.

The vote having been adopted, it was appropriately acknowledged by Mr. GLAISHER, and thanks having been accorded to the chairman, the proceedings terminated.

EAST LONDON WATER-WORKS COMPANY.

The following Report of the Directors will be submitted to the Proprietors, at the Half-Yearly General Assembly, to be held at the Company's Office, on Thursday next:—

The directors herewith submit to the proprietors the half year's accounts to Christmas last, examined and passed by the auditors.

The revenue from water-rates amounts to £94,039; the amount at Christmas, 1873, was £91,281.

The expenditure for maintenance and management for the half year ending Christmas, 1874, was £35,957; for the corresponding half year ending Christmas, 1873, £36,115.

The expenditure on account of capital was £4027 13s. 8d., this outlay having been for additional mains and services.

The quantity of water pumped during the half year amounts to 4,237,019,787 gallons. The whole quantity pumped during the year exhibits an increase over the year 1873 of 41,147,244 gallons.

The new shares created April 2, 1868, have now merged into the ordinary stock of the company, making the total amount of that stock £1,624,710. The additional amount required half yearly for dividend at the present rate of 6 per cent. per annum, will be £2437 10s.

Your works and property are all well maintained and in good working order.

The water examiner appointed under the Metropolis Water Act, 1871, in his report, dated the 10th of February last, to the Local Government Board, says: "The East London Company have completed the extension of the constant supply in a considerable part of their district which is densely populated, and are bringing their district, section by section, under constant supply. This company possess such ample impounding reservoirs, that their supply is not affected by floods, during the prevalence of which their intake is closed."

In December last the directors received a letter from the Metropolitan Board of Works, referring to the subject of the supply of water at fires, and the directors in a reply, carefully prepared, have again pointed out the imperative necessity for the introduction of hydrants by that board throughout the metropolis. The extension of constant supply increases the importance of that work being carried out. No reply has yet been given to this letter.

Three directors, Messrs. Helme, Dalton, and Oxley, go out of office by rotation, but all are eligible for re-election. They have given the usual notice, as required by the company's Act of Parliament.

The accounts of the company are now fully and minutely examined by an auditor appointed under the provisions of the Metropolis Water Act, 1871, whose report is presented to the Local Government Board, and published by order of the House of Commons; but as the clause in the Company's Clauses Consolidation Act, 1845, remains in force, it is requisite that two auditors shall be appointed by the proprietors.

Your two auditors, Messrs. Helme and Baddely, go out of office by rotation. Mr. Helme retires in consequence of his advanced age, and does not offer himself for re-election.

The directors recommend that a dividend at the rate of £3 per cent. for the half year on the ordinary stock, and of £2 5s. per cent. on the debenture stock, both clear of income-tax, be declared payable on the 10th of July next in the usual manner.

WATCHET AND WILLITON GASLIGHT AND COKE COMPANY.—The annual meeting of the shareholders of this company was held on the 11th inst.—Mr. Thomas Horne presiding. The statement of accounts for the past year was read, discussed, and passed. It appeared from it that there had been a considerable expenditure in repairs. Messrs. William Stoate, John Thorne, and James Thristle, jun., were the retiring directors, and they were all unanimously re-elected. Messrs. R. A. Sparks and A. Williams were elected auditors for the ensuing year. A dividend of 2 per cent. for the past year was declared.

HUDDERSFIELD (CORPORATION) GAS SUPPLY.—A meeting of the inhabitants of the Lockwood Ward was held on the 22nd inst., to take into consideration the question of the extension of the supply of gas for Barton to Dry Clough, and Crosland Hill. Alderman Hirst was elected chairman. Mr. A. Sykes, of Crosland Hill, moved, Mr. Burman seconded, and Mr. W. R. Croft supported, the adoption of the following resolution:—"That this meeting is of opinion that it is just and expedient that gas-mains be laid from the present main in Barton Road to Crosland Hill, and from Tom Lane End to the dwelling-houses in Dry Clough Road, in the Lockwood Ward, at the expense of the corporation." The resolution was passed.

CAGLIARI GAS AND WATER COMPANY, LIMITED.

The Ordinary General Meeting of Shareholders was held at the Offices of the Company, No. 2, Moorgate Street, London, on Tuesday, the 23rd inst—ERASMUS WILSON, Esq., F.R.S., in the chair.

The SECRETARY (Mr. Rod. Mackay) read the notice convening the meeting, and the following report and statements of account were submitted:—

The receipts on revenue account for the past year amount to £17,024 6s. 5d., and the expenditure to £10,027 17s. 11d., leaving a clear net revenue for the year of £6996 8s. 6d.

The amount available for dividend, including the balance brought forward from the previous year, as shown on the balance-sheet, is £7120 8s. 2d., out of which an interim dividend at the rate of 4 per cent. per annum was paid for the half year ending June 30, 1874, amounting to £2862 8s. The directors recommend a dividend at the rate of 5 per cent. per annum for the half year ending Dec. 31, 1874, amounting to £3589, leaving a balance to be carried forward to next year's account of £669 0s. 2d.

The water receipts for the year show an increase of £565 over those of the previous year. This increase is in the additional direct house supply in Cagliari, and in the supply to the villages beyond Cagliari.

The gas receipts have not materially increased, but the receipts from products—viz., coke, tar, &c., show an increase of £330.

The loss from gas leakage has been satisfactorily reduced during the year, the average being 14 per cent. for the year, and for the month of December last it was only 10½ per cent.

The reduction in the high price paid for coal last year has beneficially affected this company's revenue, there being a saving of £854 in the expenditure under this head.

With a view to encouraging the consumption of gas, and in the hope of increasing the company's receipts, the directors have recently authorized a considerable reduction in the price charged to private consumers, and they trust that this will be appreciated by the consumers and be beneficial to all parties.

The directors have, for a long period, and by every means in their power, appealed and protested against the rates and taxes which they considered were levied so unjustly upon this company in Italy in the face of the original concession. Although they have not succeeded in getting rid of these charges, an arrangement has been made by which, for the future, the payment will be considerably less than the amount appearing in the annexed accounts for the year.

Mr. H. P. Stephenson had been compelled, through ill health, to resign his seat at the board, but the directors trust that he will speedily recover, and be able to join them again, his services and assistance at the board having been of the greatest value to the company.

The directors have elected Mr. J. Orwell Phillips, a gentleman of well-known experience in gas manufacture, to the vacant seat at the board.

It will be gratifying to the shareholders to know that the directors have recently received an acknowledgment from the authorities at Cagliari of their perfect satisfaction with both the quality and supply of water and gas, and at the same time they paid a high tribute to M. Simmelkjor's excellent management.

The directors retiring by rotation are Mr. John Aird, jun., and Mr. Joseph Maynard, who, being eligible, offer themselves for re-election.

Dr. Revenue Account, for the Year ending Dec. 31, 1874. Cr.

Maintenance of water-works—				Water—		
Reservoirs and filters in Corungiu	£129	10	7	Subvention	£9,600	0 0
Main to town	40	10	9	Shipping	92	14 6
Reservrs. & mains in Cagliari	126	8	7	Supply beyond Cagliari	431	5 6
Gas manufacture—				Ditto in Cagliari	912	14 5
Wages	739	6	6	Gas—		
Coals	2,869	2	10	Public lamps	1,845	1 10
Stores	422	17	9	Private lights	2,195	18 9
General charges in Cagliari—				Products	1,474	8 10
Salaries	1,035	7	9	Transfer fees	0	15 0
Office rent, stationery, travelling expenses, &c.	451	5	7	Sundry work and sales of material	404	12 4
Rates and taxes	1,253	19	0	Interest on amount due for executed works	66	15 3
General charges in London—						
Directors and auditors fees	281	10	0			
Salaries and office rent	225	0	0			
Stationery, bill stamps, and petty disbursements	47	0	5			
Prem. on insurance of works	30	0	0			
Law charges and expenses	227	4	0			
Income-tax	66	14	9			
Exchange on remittances	1,346	17	7			
Interest and discounts	585	1	10			
Sinking-fund	150	0	0			
Balance—Net profit for year carried to gen. balance sheet	6,996	8	6			
	£17,024	6	5		£17,024	6 5

Capital Account and Balance-Sheet, Dec. 31, 1874.

Gas and Water-Works—				Capital, authorized by Memorandum and Articles of Association, 7500 shares of £20 each	£150,000	0 0
Total amount expended, including preliminary expenses, to Dec. 31, 1873, per last account	£148,241	14	11	7178 shares, subscribed to Dec. 31, 1874	143,560	0 0
Expended during year	1,051	13	6	Loan on mortgage	5,000	0 0
Cash at company's bankers, and in hand	787	12	8	Sundry debts due by the company	5,611	11 1
Sundry debts due to the company	6,494	13	11	Bills payable	520	4 9
Amount due for works executed	1,240	0	0	Sinking-fund	1,401	4 6
Revenue expenditure for 1875	15	0	0	Revenue net profits—		
Stores on hand at Cagliari—				Balance at Dec. 31, 1873	£5,843	11 8
Coals	646	16	0	Less div. paid for the year 1873	5,719	12 0
Products	129	12	0		£123	19 8
Goods in transit	643	16	9	Year to Dec. 31, 1874	6,996	8 6
Investment in share capital of company (sinking-fund)	1,100	0	0		7,120	8 2
Payment on account of dividend, Oct. 8, 1874	2,862	8	0			
	£163,213	7	9		£163,213	7 9

The CHAIRMAN, in moving the adoption of the report, said it would be seen that there had been a decided improvement in the affairs of the company during the past year. This was more especially manifested in the water department. The importance of having an efficient supply of water laid on to the town was now appreciated by the inhabitants, and in consequence it was being now more extensively taken advantage of than formerly. The progress of the gas department was not so good as that of the water, and this for a very striking reason, as far as Cagliari was concerned—which was, that they enjoyed so much daylight, and had but very small shops, so that they had not the necessity nor the opportunity of burning gas to the extent that existed in many other countries, especially in England. The directors had received satisfactory reports from their engineer as to the state of the leakage, which, it would be remembered, was at one time very high. A great diminution had fortunately taken place in this respect, and last December it had been reduced to 10½ per cent.—the average for the whole of the past year having been 14 per cent. The company were now beginning to derive the advantages of the reduction which had taken place in the cost of coal, and, what was of great importance, the recognition by the inhabitants of Cagliari of the value of the residual products of gas manufacture. It would be seen from the accounts that there had been a satisfactory increase in the figures for the sale of coke, tar, &c. It would also be observed that in consequence of a proposition made by the engineer, who was well acquainted with the character and habits of the people, there had been a reduction made in the price of gas, in the hope that this might lead to its more free and general use. The company were getting over some of their difficulties with regard to the payment of rates and taxes, and the directors were in hopes that future accounts would show a considerable reduction under this head. It was his painful duty, in the next place, to mention that, owing to ill health, Mr. H. P. Stephenson had been compelled to resign his seat at the board. By all who knew Mr. Stephenson it would be easily understood that the loss of his advice and counsel was very serious to the directors. His thorough practical knowledge of all matters connected with the manufacture and supply of gas rendered him a very valuable colleague, and the directors regretted extremely the necessity for his retirement. They were, however, gratified to state that they had found an able substitute in Mr. John Orwell Phillips, a gentleman of great practical experience in all gas questions, who had accepted the vacant seat at the board. With these remarks, he moved the adoption of the report.

Mr. JOHN AIRD seconded the motion with much pleasure, for he thought there were circumstances in connexion with the report on this occasion that quite bore out the hopes that were suggested when the directors last had the opportunity of submitting a statement of affairs to the shareholders, and which pointed also to further successes that might be looked for in the future. There was, no doubt, as the chairman had very properly stated, that up to the present date the gas department had not been so prosperous as the remainder of the works belonging to the company. At the same time there was one point about it particularly gratifying, and one to which the attention of the shareholders ought to be directed, and that was the large amount received in the past year for the sale of residual products taken in connexion with the diminished cost of coal required for gas manufacture. The shareholders should also be reminded that although there had been a considerable reduction in the cost of coals as compared with the previous year, yet, having regard to the time at which coals had to be sent out before they were used, the advantage of the reduction was scarcely felt in the accounts now submitted. Looking at all the circumstances, he could not help thinking that this little company, which had been under a cloud for the last year or two, might be congratulated upon being able now to emerge somewhat from its difficulties, and he believed that if the shareholders would have patience it would soon regain its original position.

A SHAREHOLDER asked for some explanation with reference to the item, "Exchange on Remittances, £1346 17s. 7d." It appeared a very heavy charge, and he wished to know whether anything could be done to diminish it in the future.

Mr. AIRD said the charge was unfortunately very high, and in the previous year it was almost as much, £1222. Since the present accounts were made up the exchange was more favourable for the company, and the directors hoped for some further benefit, but it was a matter which no efforts on their part could control. As he stated on the last occasion, the loss by "exchange" meant 1 per cent. loss of dividend to the shareholders.

The motion was put and carried unanimously.

The CHAIRMAN said the directors had had the advantage of receiving from Mr. Phillips, who recently made a visit to Italy for his health, a report on the state of the works of the company. The document was somewhat too lengthy to read to the meeting, but probably Mr. Phillips would favour the shareholders with a few words as to the general impression he formed of the affairs of the company from the inspection he had made. Before, however, asking him to do so, he (the chairman) might refer to another document which the shareholders would be gratified to hear. It was a translation, from the Italian, of the report of the senior syndic assessor, dated Feb 4, 1875. He said: "I have the pleasure to hand you the information you desired, respecting the manner in which the relative services are performed in the city on the part of the company which has undertaken the water supply and the lighting by gas. I am able to furnish you with ample testimony that both the one and the other leave nothing to be desired, either as regards the exactness and the precision in the discharge of the liabilities and the duties assumed, or the abundance and excellence of the water, and the pressure and clearness of the gas. I must also render a well-merited tribute of praise to Mr. Simmelkjor, the engineer and representative of the company aforesaid, who, while he directs the affairs of the company with intelligence and zeal, is particularly attentive in carrying out the wishes of this municipality, whereby he has not failed to acquire the good-will of every one of the citizens." This communication was particularly gratifying to the directors, as showing the great care and ability with which Mr. Simmelkjor represented the interests of the company in this foreign town.

Mr. PHILLIPS said he had much pleasure in complying with the request of the chairman to give the meeting some little idea of the impression made upon his mind by the visit which he paid to the works. And first of all he would add his testimony to that of the syndic assessor, as to the admirable manner in which the undertaking of the company, both in the gas and water departments, was conducted by Mr. Simmelkjor, who seemed to know everything necessary to be known, and to have everything at his fingers ends. At the same time, he possessed such an amount of tact as enabled him to deal in the most admirable manner with a peculiar people like the Italians, and which left nothing to be desired in the interests of the shareholders or of the inhabitants of Cagliari. The water portion of this company seemed to him (Mr. Phillips) perfectly secure. Nothing could be more economical than the way in which the storeage of the water was effected, or with which its distribution through the town was administered. The means of purification also were very simple and efficacious. On this department of the company's operations a certain sum was secured to the shareholders, which paid a good profit on the capital. But with reference to gas, something more was necessary. The consumption was somewhat limited, partly because the shops were few, and because they were very small in extent. In a hot climate like that of Cagliari, and in small and crowded places like these stores, it was impossible to use a large amount of gas. In point of fact, they seldom used more than two burners in them; a great number had none at all, but were lighted with oil or petroleum. The reduction that had been made in the price of gas would, he thought, bring the cost of lighting below that of other means of illumination in three-fourths of the whole place, and taking this in connexion with its additional convenience, cleanliness, and comfort over the wretched little lamps hitherto used, he thought that before two years were over there would be a considerable increase in the gas-rental of the company. It would take another year before the good effects would be realized, because the people were somewhat slow to move. What had, however, been achieved in the case of the water supply gave them good ground for encouragement. The water having been brought to the doors of the houses, the inhabitants had got hold of the idea that they must have it; and when once they saw the advantages and economy of a gas supply, they would come to regard its necessity in the same way. The public buildings were not numerous; but Cagliari, like other places, was increasing. There was a hospital in the town, built on an enormous scale, which was now being finished; other public buildings also were springing up, and the supply of water was being laid on to a large prison. No doubt before long the gas would be supplied in the same way. There were also large salt-works, at which a supply of both water and gas would be required; and he had every reason to believe, from a minute inspection of the whole place, that in the wide streets and narrow alleys of the town there would be a fair demand for gas before long. The gas-works were certainly as substantial as any he had ever seen; perhaps more substantial than was necessary, and certainly much larger, but the company would have the benefit of that by-and-by. The wear and tear was small, and the cost of any extensions hereafter required would not come to much. The steps now being taken by the manager to reduce the unaccounted for gas were telling their own tale, the percentage of leakage having been reduced from 14 to 10 per cent., with a prospect of a still further reduction. He would again add his testimony to the admirable manner in which Mr. Simmelkjor managed the whole affairs of the company, and the ability with which, while attending to the interests of the shareholders, he contrived to secure the respect and good-will of the municipality and of the inhabitants generally.

The CHAIRMAN, in reply to a shareholder, said the reduction in the price of

gas was from 8s. to 6s. 9d. The reduction, which was only to private consumers, had been made in the hope of effecting a larger consumption.

The SECRETARY said the whole of the gas revenue from the private lights at present was only £2200, and the reduction, taking it at ·25 per cent., would only involve a loss of £500, which they expected to make up by increased receipts.

A SHAREHOLDER expressed the opinion that it would be better to abandon the gas department.

Mr. AIRD said he was satisfied it would not be to their interests to do so, having incurred the expense of providing the works. Moreover, the terms of their concession would not allow its abandonment. And it must be remembered that though the reduction in the price of gas seemed considerable, the residual products yielded a good return, and if a larger quantity of coal was consumed, the company would recoup themselves the entire loss. The coke fetched £2 10s. per ton.

Mr. PHILLIPS remarked that the demand for coke was so great that the company could not meet it.

The CHAIRMAN then moved—"That the interim payment on account of dividends on the 8th of October last be, and is hereby confirmed, and that a dividend for the half year ending Dec. 31, 1874, at the rate of 5 per cent. per annum, less income-tax, be now declared."

The motion was carried, and the retiring directors and auditors were severally re-elected.

A cordial vote of thanks was given to the chairman and directors for their services.

The CHAIRMAN acknowledged the vote, and the proceedings terminated.

PRESTON GAS COMPANY.

The report for the year 1873-4, issued from the borough accountant's office, and presented to the Finance Committee of the corporation, has just been issued. It appears from this report that the income of the company has been £53,470 5s. 2d., the expenditure £38,249 14s. 10d., and the net profit £15,220 10s. 4d. The reserve-fund on Nov. 30, 1874, was £22,695 14s. 10½d. No allotment of additional capital has been made during the past year. The amount borrowed on loan has been reduced by £400 since November, 1873.

The quantity of gas supplied during the year has been as follows:—To ordinary consumers, Preston and Fulwood and out-townships, 218,477,104 cubic feet, at a gross charge of £45,902 9s. 3¼d. Upon this discounts, bad debts, and abatements amounted to £7047 9s. 7¾d., leaving the net amount received for private consumption £38,854 19s. 7½d. To street-lamps the quantity supplied was 14,818,096 cubic feet, at a net charge of £2469 13s. 8d.; the total consumption being 233,295,200 cubic feet, and the net revenue £41,324 13s. 3½d.

The following was the company's position on Nov. 30, 1874:—

Capital and Liabilities.		*Property and Assets.*	
Capital (10 per cent.)	£120,000 0 0	Works, mains, meters, &c.	£236,792 1 5½
Ditto (7 per cent.)	51,000 0 0	Stores of cannel, &c.	4,356 0 3
Premiums on sale, Stock B.	88 12 3	Debtors for gas, coke, &c.	1,294 19 6
Loans	38,499 8 6	Balance in bank	1,267 6 7
Reserve-fund	22,695 14 10½		
Dividends due, Feb. 1, 1875	7,785 0 0		
Creditors	3,641 12 2		
	£244,710 7 9½		£243,710 7 9½

The proportions of material used in gas manufacture during 1874 have been 59·17 per cent. of cannel, and 40·83 per cent. of coal.

During the past year the consumption of gas in the borough and Fulwood has been 9,516,391 cubic feet more than in 1873, and in the out-townships 606,700 cubic feet more, being a total increase in sale of 10,123,091 cubic feet more than in 1873, or 4·63 per cent. The quantity of gas used in the public lamps has also increased 321,409 cubic feet over 1873.

The cost of making gas, and all other expenses, has been ·51d. per 1000 cubic feet more than in 1873, and the residuals have yielded 3·18d. per 1000 cubic feet less than in 1873.

The following shows the proportion of revenue and expenditure under different heads, and the amount per 1000 cubic feet of gas sold:—

Income.

	Proportion per Cent. on Total Income.	Per 1000 Cubic Feet of Gas Sold.
Gas-rents	77·31	42·51d.
Meter-rents	4·51	2·49
Residuals	17·98	9·89
Sundries	0·20	0·11
	100·00	55·00

Expenditure.

	Proportion per Cent. on Total Income.	Per 1000 Cubic Feet of Gas Sold.
Manufacture	48·90	26·79d.
Maintenance	12·55	6·90
Management	7·69	4·21
Interest on loans	2·42	1·34
Net profit	28·46	15·66
	100·00	55·00

The company's present position, as compared with nine previous years, is given below:—

	Expended on Works.	Gas Sold in Millions.	Net Profit.	Added to Reserve.
1865	£149,450	134	£13,842	£1,842
1866	155,878	164	15,004	3,004
1867	166,915	176	14,458	2,143
1868	181,134	175	12,566	146
				Deducted.
1869	201,321	169	11,686	1,521
1870	206,799	180	11,874	15
				Added.
1871	212,294	208	18,312	4,264
1872	223,710	225	20,372	5,222
1873	226,974	222	17,854	2,284
				Deducted.
1874	236,792	233	15,220	349

At the meeting of the Preston Town Council, on Thursday last, Alderman GILBERTSON, speaking of the financial position of the gas company, said that those gentlemen present who had read over the statement of accounts which had been sent to them, would notice that the increase in the price of materials used in the production of gas had certainly left a trace on the face of the accounts in the statement of net profits. It appeared that the net profits last year were £15,220, for the preceding year £17,854, and for the year 1872 £20,372. The directors of the gas company were to be commended for the admirable manner in which they had conducted the affairs of the company. So far as regarded the purchase of material, they had been fortunate enough to make a very valuable contract for three or four years for the supply of cannel, which had enabled them to surmount the difficulties which they would otherwise have felt in the rise of the price of material. The cost of making gas had increased over the year 1873, but judging from the accounts, the manufacture of gas was not so profitable a business as it used to be. He called the attention of the council to the fact that the gas company were entitled to a reserve-fund of £24,000 to draw upon when their profits fell short of the amount required to meet the maximum dividend. They could not, however, increase upon that sum. When the profits exceeded that, they were bound to reduce the price of gas. He thought the directors managed their business in a very fair way, but the time when reduced rates would be made from the excess of profits beyond the amount required for dividend and reserve-fund he was afraid would never arrive.

Mr. DOBSON, as a director of the gas company, said he thought the remarks of Mr. Gibertson had been made in an exceedingly fair spirit. Most of them knew that the company had been exceedingly benefited by a contract made a few years ago, so much so that they had been only paying somewhere about two-fifths of the market price for coal and cannel; and on that account they had added very considerably to their reserve-fund for the past few years. But during the last twelve months they had not been able to do so much in that respect, inasmuch as the coal trade had been exceedingly unsettled, and the contractors for the supply of coal and cannel had been unable to fulfil their contract. The company consequently had to purchase at the market price, and so they had been obliged to draw upon their reserve-fund. However, the contractors for the supply of coal and cannel had intimated their intention of fulfilling their bargain, and supplying at the old price the quality they had hitherto been deficient in. The term of the contract would expire next July, but the contractors not having been able to supply the necessary quantity during the first year, the company would have a large quantity to come at the old rate during the whole of next year. They, of course, knew that when the stipulated amount allowed for the reserve-fund was exceeded, they were bound to reduce the price of gas. But it must be remembered that the company were not now charging the full price allowed by Act of Parliament. They allowed 5 per cent. beyond the discount named in their Act of Parliament to all who paid their accounts within 21 days, and gave an extra quality of gas than was required of them. They supplied gas of an illuminating power of between 19 and 20 candles, whereas only 18 was the power stipulated by law. The quality of gas supplied was equal to that in any town in Lancashire, and he believed there was no company, or not more than one, that charged a lower rate. He could say, on behalf of the gas company, that they were willing to act in a fair spirit to the public of Preston, and he believed the shareholders would approve of the directors so acting.

Alderman EDELSTON inquired when the company intended to reduce the price of gas. He thought that was about the most important question.

Mr. DOBSON said they would do so as soon as ever the amount of the reserve-fund reached the limit fixed by Act of Parliament. In fact, they would then be obliged to do so.

Alderman GILBERTSON thought that, considering the corporation used such a quantity of gas, some reduction might be made to them.

Mr. DOBSON said the same reduction was made to the corporation as to all equally large consumers. The allowance to such parties was required by Act of Parliament.

Alderman EDELSTON: They are not prevented from making us a margin.

The matter then dropped.

BRISTOL WATER-WORKS COMPANY.

The Annual Meeting of Shareholders was held on the 20th inst.—W. S. FRY, Esq., in the chair.

The SECRETARY (Mr. Alfred J. Alexander) having read the notice convening the meeting, the following report of the directors was submitted:—

The board have pleasure in reporting that the revenue from water-rates for the year 1874 was £51,329 17s. 4d., being an increase of £4388 6s. 8d. over that of the previous year. The sum shown by the revenue account annexed to be now applicable for dividend is £11,709 11s. 8d., which includes £1000 written off from the reserve-fund, and the directors recommend that a dividend of 5 per cent. on the old and new ordinary shares be now declared; this, with the intermediate payment of 5 per cent., will make the dividend for the year 10 per cent.

During the past year there has been a large increase of charge upon income in respect of pumping, owing to the dry season, and of rates and taxes as compared with the previous year. The number of houses and other premises connected with your mains during the past year is highly satisfactory, as shown by the steady increase of the revenue.

The board have to record the death in the past year of their late valued chairman, Mr. Henry Abbot, which they do with deep regret. He was the chairman for the last five years, and a director of the company since 1854, during which time he watched over your interests with untiring energy and great ability. The vacancy thus occasioned at the board has been filled by the election of his son, Mr. Henry Napier Abbot, solicitor.

During the past year Mr. Thomas Bell has also been removed by death; he was the resident engineer from the commencement of your works, having been engaged by the late Mr. Simpson, your engineer-in-chief, in surveying the country round Bristol, and in planning the works which are now of such great benefit to a large population, and your board gladly bear testimony to the zeal and practical skill which he devoted to your service.

The drought of 1874 was of an exceptional character, and the deficiency of rainfall was nowhere more apparent than in the districts from which your supplies are drawn. The Local Government Board, impressed with the importance of a sufficient supply, issued to local authorities a circular suggesting that the attention of water companies should be called to the necessity for economizing the stores at their command. Many important towns were placed on short quantities, whilst your works maintained the usual ample supply to all consumers without limitation of the statutory hours as prescribed by the Act of Parliament.

The duty of providing the means of increasing the supply to meet the growing demands of the city and suburbs is one which your board has always fully recognized and acted on. With this view, Mr. Taylor, C.E., your consulting engineer, is now engaged preparing plans and specifications for an additional large main for the supply of Bristol, which will be connected with the Barrow reservoirs and the pumping main from Chelvey.

Mr. Henry William Pearson has been appointed resident engineer. He was the assistant to the late Mr. Bell, and the knowledge of your works so acquired, and his previous engagements, render him very eligible for the situation.

The capital expended during the past year was £6502 18s. 7d., and the length of mains laid about 4½ miles. The engineer reports that the works are in good condition.

The retiring directors are Mr. Fry and Mr. Abbot, who are eligible, and offer themselves for re-election. The retiring auditor is Mr. Curtis, who offers himself for re-election.

The CHAIRMAN, in moving the adoption of the report, referred, in feeling terms, to the losses the company had sustained by the deaths of the late chairman and engineer. From the accounts the shareholders would see that the past year had been a very good one, and the increase of £4300 was a larger increase than they had had for many years. On the other side, the expenditure had considerably increased; but he thought there had been no year during which they had received as much evidence as to the desirableness and the value of the company's works as they had in the course of the last twelve months. The pollution of the wells in Bristol was becoming generally admitted, so that the value of the supply of water furnished by the company was more and more appreciated. Many large institutions and works had come upon their supply, having been compelled to come to them owing to the water hitherto used by those institutions and works having been found unfit for use. The directors had always recognized as one of their leading duties the maintenance of a supply of water for the city, and they had now placed in the hands of Mr. Taylor, their engineer, a scheme for preparing an additional large main for the supply of Bristol, and the main would be connected with the Barrow reservoir.

The MAYOR (Mr. C. J. Thomas) seconded the motion, which was put and carried.

On the motion of the CHAIRMAN, seconded by the MAYOR, a dividend at the rate of 5 per cent. was declared for the half year ending the 31st of December last, and made payable on the 15th of April next.

The retiring directors and auditor were re-elected, and a vote of thanks was given to the board for their services.

A resolution was also adopted, after some conversation, remitting to the consideration of the directors whether any present should be made to Mrs. Bell in recognition of the services of her late husband, the engineer of the company.

THE COST OF IMPROVING LONDON.

[From the *Pall Mall Gazette*.]

Colonel Makins put a very significant question in the House of Commons on Monday night, and its significance to the community is not in the least affected by the fact that Colonel Makins immediate object in putting it was to relieve some of the London gas companies, who certainly deserve very little public sympathy, from the attacks of the Metropolitan Board of Works. The member for South Essex wished to know from the Home Secretary "whether his attention had been drawn to the fact of bills being introduced by the Metropolitan Board of Works, at great cost to the ratepayers, without any statutory authority enabling them to initiate legislation, especially in reference to the gas supply of the metropolis; and whether the Government proposed to confer such power upon that body by special Act." The whole question must be regarded as a mild stroke of irony; but, if Colonel Makins is of opinion that he can awaken the compunction of the Metropolitan Board, or the vigilance of the ratepayers, or the anxiety of the Government, by his satiric touches, he over-estimates the pungency of his sarcasm. The faith of the board in its own omnipotence and universality of function is only equalled by a confidence in its invincibility, justified by years of successful disregard of criticism. It is so difficult, under the present constitution of London government, for any number of aggrieved ratepayers to muster a power by which they can make their indignation felt, the process of winning a hearing through the entrenchments of double election, with which the central governing power in London local affairs has surrounded itself, is so painfully slow, that few indeed have the patience to pursue an attack even upon the most glaring scandals. It will not be forgotten that, though some little good was done by the parliamentary exposure of the affair on which Lord Edmund Fitzmaurice insisted, the Metropolitan Board ultimately carried its point, and charged the expenses incurred for the vestrymen's seats, on the occasion of the Thanksgiving, to the account of the ratepayers. And so it has happened with many other cases of unjustifiable expenditure, including that on which Colonel Makins bestowed his satire on Monday evening. The public is moved, it may be, for a moment. The strength of the Metropolitan Board is in sitting still. It attempts no answer, offers no reparation, and when the storm of indignation outside has died down, it goes coolly on in the path it has chosen.

The charge involved in Colonel Makins question to Mr. Cross is a very grave one; it is that the Metropolitan Board, without any legal authority, has incurred, and is incurring, a large outlay in the prosecution of parliamentary bills, many, if not most, of which have been abandoned long before they came near the stage of maturity. If the board had thus acted in defiance of law, Colonel Makins inquired whether the Government had any intention of introducing legislation to supply the power that was wanting, and, it may be presumed, to indemnify the previous unwarranted act. It was left to be inferred that if the board had not at present the power, and if the Government had no intention of obtaining it for the board, the action previously taken was unlawful and open to some punishment, direct or indirect, while for the future similar action could be effectually held in check. The Home Secretary, however, pointed out that the Metropolitan Board did not admit that absence of statutory authority for the proceedings challenged which Colonel Makins assumed in his question. He said that the board "claimed" the power disputed under a particular section of the Metropolis Local Management Act, though he was careful to avoid expressing any opinion of his own upon the merits of the claim. He added, in terms unfortunately vague, that "the board also claimed that under other Acts similar powers were conferred upon them, more especially with regard to gas." We cannot certainly say what statutes or what provisions of them Mr. Cross had in his mind when he made allusion to this latter claim. But the former is easily tested, and it opens up a series of questions which the ratepayers of London would do well to put to themselves forthwith.

The Metropolitan Board, then, which is supposed to be confined as to its action, and consequently as to its expenditure, within very narrow limits, claims in one direction an unfettered freedom of initiation. It is true that without the sanction of Parliament the board can carry out no project of change in the metropolis; but one thing it can do without any such sanction—it can spend money freely in coming before Parliament with plans of improvement which are foredoomed by their preposterous character to early extinction. The section of the principal Act which regulates, as it is claimed, the powers of the board in this particular is the 144th (of 18 & 19 Vict., cap. 120). Among other things it provides that the board, "where it appears to them that further powers are required for the purpose of any work for the improvement of the metropolis, or public benefit of the inhabitants thereof, may make application to Parliament for that purpose, and the expenses of such application may be defrayed as other expenses of the said board." The Act contained originally a restriction as to the commencement of works, the estimated expense of which would exceed £50,000, requiring in some cases the approval of the Office of Works, and in others the express sanction of Parliament; but it does not appear that this proviso, which was subsequently repealed, was construed as curtailing the authority of the board in regard to the promotion of parliamentary bills. It rests, according to the most obvious construction of the broad language of the statute quoted, entirely with the board itself to determine whether any project can be regarded as a "work for the improvement of the metropolis," and whether application shall therefore be made to Parliament for power to carry it out at the cost of the ratepayers. Any wild or worthless scheme might thus be promoted by the board. We might have a bill presented providing that a caged nightingale should be hung on every tree along the Victoria Embankment, or that the main drainage outfall works at Crossness should be decorated twice a year with ten cartloads of exotic plants. Of course the House of Commons or House of Lords would at once throw out any project of legislation manifestly oppressive or absurd, though it is hardly safe to leave the decision of what may be for the interests of Londoners in the hands of a parliamentary committee chosen at random. But, meantime, the expenses of promotion—including counsel's opinion, the advice of professional experts, and the whole costly machinery of parliamentary agency—have been incurred. Perhaps, as lately happened in the case of the Gas Purchase Bill, which may be presumed to have especially excited Colonel Makins wrath, the scheme is abandoned just at the moment when issue should be joined upon its merits. But the expenses of promotion do not disappear when the project itself vanishes. They remain, and figure in the aggregate for very large sums in the budget of London government. The total amount spent by the Metropolitan Board, say within the last ten years, on schemes demanding parliamentary sanction that have failed to reach maturity would reach a very startling figure if it were possible to separate it from the ingeniously intricate accounts of the board. But, at any rate, what we contend is that the board does not enjoy to such a degree the confidence of the ratepayers of London as to justify its retention of powers so wide and vague. The board is almost beyond the reach of those who are technically its constituents, and it is made up principally of second-class tradespeople, who are probably the most impervious of all classes to the influences of public opinion. It is not satisfactory to entrust to such a body the power of scattering patronage broadcast among the professional men of all sorts who profit by private bill legislation even when it is abortive. It is still more dangerous to give any body of practically irresponsible persons the power, for any purpose, of terrorizing individuals and private corporations by threats of parliamentary interference.

IRON AND COAL TRADES OF SHEFFIELD, SOUTH YORKSHIRE, AND NORTH DERBYSHIRE.

(FROM OUR OWN CORRESPONDENT.)

Owing to the near approach of the Easter holidays, and the consequent fact that the majority of the foundries and other iron-works would remain closed from Thursday evening until Wednesday morning, there has been an increased activity in several branches of trade, in order to afford compensation to both employers and workmen for the loss of time so occasioned.

There has been much activity observable in the brass foundries, which have turned out heavy lots of bib and ball cocks, hydrants, valves, closet-levers, hot and cold water taps, high-pressure meters, sluice-cocks, and other water fittings, besides other various articles in general use by steam fitters, engineers, and plumbers. The large establishment of Messrs. Guest and Chrimes, at Rotherham, has, of course, been the leading producer in the district, that firm being still well supplied with orders. At the chief foundries a steady amount of business has been done in general castings, and the special articles which have been mentioned in these notes several times within the past few weeks.

There is a very quiet feeling in the South Yorkshire and North Derbyshire coal trade, but it is, nevertheless, urged in many quarters that as soon as the shipping season has fairly set in, a much better business will be done in steam and gas coal, and more particularly if the great dispute in South Wales should remain in its present unsettled condition. It is, however, certain that all the local coalowners do not share that opinion, seeing that some of them are now offering to enter into contracts at prices which are not only under the average of the last two months, but are under the quotations of the beginning of March. As soon as April has well set in we may expect to hear of a material drop in house, and possibly also in steam and gas coals.

IRON AND COAL TRADES OF SOUTH STAFFORDSHIRE AND EAST WORCESTERSHIRE.

(FROM OUR OWN CORRESPONDENT.)

At the long looked-for meeting of the Associated Coalmasters, on Thursday last, for the purpose of determining the important question of prices for the ensuing quarter, it was decided that no alteration should be made at present. Though the meeting was a private one, it is pretty generally understood that the coalmasters were mainly influenced in their decision by the consideration that no alteration could be made in the rate of wages until the expiration of six months notice at Michaelmas next, when the trade will be entering upon its busiest season, and the tendency of prices will in all probability be upwards. It is needless to say that this announcement has caused great dissatisfaction throughout the district; and it is a noteworthy fact that many individual coalowners are now underselling the associated masters. Under these circumstances, little change can be expected in the quotations for iron, either in the pig or finished departments, and several of the leading ironmasters have already intimated their intention of adhering to existing rates; and in justification of this course, they point to the results of the past half year's working of local iron-making firms, as shown by the published reports of the Chillington and other companies, and urge that it is impossible to manufacture iron profitably at present prices. Quotations for best branded iron are therefore firm on the basis of £10 10s. to £11 12s. 6d. for bars, with the usual extras for other descriptions. Common iron, though not quotably lower, is very weak, being now in abundant supply on the standard of £8 15s. for bars. Makers of best sheets, boiler-plates, and galvanized roofing sheets continue moderately employed, but in other departments of the trade there is little business being done, and the condition of the trade generally is most unsatisfactory.

The pig iron market is quiet but steady, favourite brands being still in fairly good request. Cinder pig is quoted £3 to £3 5s. per ton, and all-mine hot blast £5.

Coal is in abundant supply, and excepting the best household qualities in the Cannock Chase district, is very slow of sale.

The dispute in the Wednesbury tube trade is still unsettled. The operatives have again received their usual strike allowance, and the organization is reported to be in a very flourishing condition.

Messrs. John Russell and Co., of the Alma Tube-Works, Walsall, have just completed the purchase of the Wednesbury Tube-Works, and the Holyhead Road Tube-Works, the property of Messrs. Brown and Co., and will, it is stated, forthwith transfer the Wednesbury branch of their business from the old works at Church Hill, which are to be given up, to the newly acquired properties.

THE COAL AND IRON TRADES OF LANCASHIRE.

(FROM OUR OWN CORRESPONDENT.)

So far as business is not affected by the holidays, a steady trade at full prices continues to be done in the better classes of coal, but for ordinary engine fuel there is not quite so much demand, the various works having been taking rather less, and prices for these descriptions are a little easier. There has, however, not yet been any actual reduction in list rates, although coal is offering for less money, and large buyers especially are in a position to obtain concessions; but a general reduction in the principal coal-producing districts is probable before long, although it may not be to any very material extent.

Gas coal has been rather dull, and some of the larger buyers report that there is a disposition to push sales in some quarters. Still, however, there is a very fair inquiry in the market, and prices, as a rule, are maintained; but it is considered probable that although canal may keep up its price, ordinary gas coal will be easier.

In the Manchester market there is little or no change to report. There is a good demand for house coal and good steam fuel, the only weakness apparent being in the inferior classes of burgy and slack. The leading concerns maintain a very firm attitude with regard to prices, and it is not at all improbable that the rates in this market may be maintained, even when reductions in outside districts are necessary.

The shipping trade continues dull, and during the past few days small reductions in prices have been necessary towards Liverpool.

In the iron trade there has been little or nothing doing during the past week. The holidays and the near approach of the quarterly meetings, for the result of which both buyers and sellers seem to be holding back, have altogether put a stop to anything like business, with the exception, however, of a few outside lots in merchants hands, which have been offering at low rates. Prices have been tolerably steady, as makers do not seem inclined to give way to anything like the extent expected by consumers, the opening of the spring shipping season tending to give a little firmer tone. Quotations, which, however, can at present only be regarded as nominal, range about 76s. 3d. to 76s. 9d. for No. 3 foundry, and 64s. to 65s. per ton for forge numbers of pig iron, Middlesbrough quality, delivered in the Manchester district. Finished iron continues dull, with prices weak.

The various iron-works closed on Thursday for the holidays, and will in many cases remain closed during the following five or six days.

THE COAL AND GENERAL TRADE OF THE NORTH OF ENGLAND.

(FROM OUR OWN CORRESPONDENT.)

On account of the continued depression in the London coal market, the tone of business in the coal trade of the North of England was somewhat weaker last week. Households would not realize more than from 12s. 6d. to 14s. 6d.; gas, from 8s. 6d. to 10s. 6d.; and small coals, from 2s. 6d. to 4s. per ton, at the pits; and duff was sold as low as 2s. per ton. The shipments of coals were far from brisk at the docks, and loading terms were tolerably ready. The collieries, with very few exceptions, are working part time.

The arrivals of coasters in the coal ports were limited in the early part of last week, but, the wind having got round to the southward on Thursday, a good few sailing ships have come to hand since, and the demand at the collieries is fully supplied. Coasting rates are about the same; indeed, there is not likely to be much change in them for some time to come, especially for the east coast and Channel ports. The shipments of goods are better, and a considerable quantity of fire-bricks and other material used at the gas-works are being sent off by sailing vessels and steamers.

The trade of the Cleveland iron district, both in the pig and finished departments, continues to improve. Business has been tolerably firm on 'Change at Middlesbrough. Nearly all the furnaces are now at full work, but stocks are cleared off pretty freely. There are no wages disputes on hand of any moment at present, and business is likely to go on pretty steadily for some time.

The chemical trade of the Tyne showed more favourable symptoms of improvement last week. Prices were firmer, and in some instances they advanced; for sorts that are scarce there is a rising market.

The award of Mr. Rupert Kettle, with regard to the Cleveland ironstone miners wages, has been published. There is to be a reduction of 2d. per ton, instead of 3d., as claimed by the owners, and wages have to be reduced from 8 to 10 per cent.

The Durham coke trade keeps pretty steady, with an improved demand at the ovens.

TRADE NOTES FROM SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

At a meeting of the Gas Corporation of Arbroath, held a few days ago, it was announced that a contract had been concluded with Messrs. Laidlaw and Son, gas engineers, Glasgow, for the supply of a new set of condensers, with tar cisterns and exhausters on their patent system. It was also stated that it had been resolved to have malleable in place of cast-iron supports for the hydraulic main. The minutes read at the meeting showed that a request from the men to be put on the eight hours system had been acquiesced in, and that, in certain cases, the wages had been advanced.

A considerable extension of the gas-works at Kirkcaldy is at present under contemplation. During the time of the high price of gas coal, the gas consumed at Dysart, a burgh adjoining Kirkcaldy, was charged 10s. per 1000 cubic feet, and even now the charge is 9s. 2d., whereas Pathhead and Gallatown, in the same parish, are only paying little more than half that sum to the Kirkcaldy Gas Company. Much dissatisfaction is, consequently, felt by the inhabitants, and the North British Railway Company are so much displeased on the subject that they have ordered a supply of gas for the Dysart station direct from Kirkcaldy.

The Glasgow Corporation Gas Annuities are advancing in their marketable value. On Tuesday last the 9 per cent. annuities rose from £211 to £211 10s., and a few days previously both the 9 per cents. and the 6¾ per cents. were advanced £1 each.

It would seem as if the Wishaw people, through their Police Commissioners, were determined to get their gas supply into their own hands, and are waiting with anxiety for the passing of the gas bill, which Sir Wyndham Anstruther is promoting in Parliament. Wishaw is paying 60 per cent. more for its gas than the adjoining town of Hamilton; and on the Hamilton rate the Wishaw gas consumers paid £2000 more for gas last year than they ought to have paid.

The directors of the Lennoxtown Gas Company, Stirlingshire, have just resolved to reduce the price of gas 10d. per 1000 cubic feet, the said reduction to take effect from the 1st of the current month. The price will now be 5s. 10d. per 1000 cubic feet. At a meeting of the shareholders of the Melrose Gas Company, held this week, it has been resolved to get an additional gasholder in order to meet the increasing demand for gas in the town and neighbourhood.

Since last report there has been a marked fall in the price of Scotch pig iron, as low as 70s. 9d., cash, being taken for warrants on Thursday. But the intrinsic value of pig iron is even lower than that price, judging by the quotations for the special brands of makers iron, some of which have been two or three times reduced as much as 2s. during the past week or ten days.

The coal market continues to be very dull, and lower prices are taken for almost all varieties of fuel; indeed, in several instances, it is said the price is under the cost of production. Steam coal is a drug in the market, and unless the shipping trade improves, no change for the better can be anticipated. Supplies of all descriptions are now very large. Wishaw Main coal is quoted, free on board at the Glasgow Harbour cranes, at 8s. 3d. to 9s. per ton; house coal, at 8s. 9d. to 14s.; splint coal, at 9s. 3d. to 10s.; steam coal, at 10s. to 11s. 9d.; and smithy coal, at 15s. 6d. The difficulty with the Fife and Clackmannanshire miners is practically settled. A conference of employers and workmen was held some days ago, when the former yielded to a compromise, limiting the reduction of wages to 15 per cent., instead of 20 per cent.

BURTON-ON-TRENT GAS-WORKS.—At the last meeting of the Town Commissioners, the Gas Committee having received replies from the feoffees and the Charity Commissioners relative to the sale of the reversionary interest of the former in the old gas-works, the board decided to purchase the same for £7800, and to bear all expenses connected with the transfer.

TUNBRIDGE SEWERAGE.—A Local Government Board inquiry was held at Tunbridge on the 16th inst., by Mr. Arnold Taylor, on the application of the Tunbridge Board of Health, for authority to borrow £4000 for sewerage purposes. It was stated that a most thorough system of drainage had been carried out by the local board. On account of the expense, they had borrowed £16,000, and now wished to borrow £4000 more.

HORSHAM GAS COMPANY.—This company commenced in 1835, with a capital of £2400, in 120 £20 shares. At various times, the capital has been increased to 303 shares, and on the 20th inst. a further addition of 50 new shares was made. The shares were advertised to be disposed of by tender, and realized an average price of £32 3s. 4d. The dividend usually paid is £2 per share, or 10 per cent. on the nominal capital. In 1835 the price of gas was 12s. 6d. per 1000 feet, which, before the coal famine, was reduced to 4s. 2d. It is now 5s.

DEATH OF MR. THOMAS DALE.—On Thursday morning week Mr. Thomas Dale, C.E., of Hull, and formerly borough surveyor of Wakefield, died suddenly at his residence. Mr. Dale's health, it is said, has gradually declined from the time he left the service of the corporation, and on Thursday morning week, about half-past one o'clok, without any previous appearance of severe illness, he died suddenly. The cause of death was fatty degeneration of the heart. Since he left the corporation's service, Mr. Dale has been in business as a timber merchant. He still exercised his profession as a water engineer, and but recently was appointed consulting engineer for the Leamington Water-Works.

MINSTER (KENT) GAS COMPANY.—The annual meeting took place on the 23rd inst., Mr. D. Swinford in the chair. The directors reported that they had had some difficulty in getting the best class of coal for gas making and producing coke, consequently the profits were not so large as they had anticipated, but sufficient had been realized to recommend a dividend of 5 per cent. to be declared. The capital of the company is £1500 (£1300 paid up) in 200 shares of £5 each and 75 of £4 each. Mr. H. Swinford moved that the report be received and adopted; this was seconded by Mr. Chase, and carried unanimously. Mr. F. Swinford was appointed auditor, vice Mr. R. Baily, resigned. Votes of thanks were passed to the chairman and directors; also to the secretary, and after some routine business, the proceedings terminated.

GAS EXPLOSION AT FESTINIOG.—An explosion of gas of a rather alarming character, but fortunately attended by a comparatively inconsiderable amount of damage, took place on Saturday, the 20th inst., at Festiniog Railway Station. A gasman from Oldham was engaged in pulling to pieces the station-meter, to repair it. It appears that he had not taken the precaution to turn off the supply of gas, and intending to examine the interior of the meter, he incautiously approached with a lighted candle. The moment he brought the naked flame near the plate-hole of the meter a terrific explosion occurred. The wooden shed in which the meter was placed was blown up, and, taking fire, it was speedily burnt down. The man himself narrowly escape injury, and the gas-house was saved.

GAS EXPLOSION IN THE CITY OF LONDON.—On Tuesday, the 23rd inst., between one and two o'clock, an alarming explosion occurred from an escape of gas at St. Paul's New Schools, now being erected in Carter Lane, Doctors Commons. The windows of the building, which was approaching completion, were blown inwards, and the windows of a number of warehouses in the neighbourhood were broken. Part of the front of the Swan with Two Necks tavern was blown in. Fourteen persons were injured. John Petit, who was passing at the time, had his hand burned, and Louis Stonor was cut with broken glass, but their injuries were not so serious as to warrant their detention at St. Bartholomew's Hospital, to which they were taken.

SALE OF THE CHARTERED GAS COMPANY'S WORKS AT BLACKFRIARS.—The gas companies, who are so accustomed to being found fault with for overreaching the public, must be greatly surprised at finding themselves in the opposite position of giving away their property for one-third of its value, as suggested by one of our contemporaries. We believe it is quite true that the Corporation of London have, for the purpose of improving the locality, purchased the site of the late City Gas-Works at Blackfriars Bridge for £170,000, but one-half of the site is already the freehold of the corporation, and if the negotiation had not taken the form of a private one, in which the gas company were represented by a firm of well-known surveyors, the best buyers (the corporation) would have been shut out altogether, as they cannot purchase in any other way.—*Globe.*

EDINBURGH WATER SUPPLY.—The report presented to the Water Trustees at their meeting on the 11th inst. shows that during the month of February the quantity of water sent into the city and district was equal to 942·37 cubic feet per minute, representing a daily supply of 8,456,899 gallons, or an average of 31·28 gallons per head per day, to an estimated population of 270,300. The average supply to Edinburgh was 31·38 gallons per head per day, to a population of 216,648. The average supply to Leith was 31·01 gallons per head per day, to a population of 47,940; and the average supply to Portobello 29·94 gallons per head per day, to a population of 5712. The inspector further stated that for a period of 879 days prior to the 1st of March current the average supply to the whole city and districts was 29·64 gallons per head per day; and during the same period the average supply in Edinburgh was 29·73 gallons per head per day; in Leith, 29·53 gallons per head per day; and in Portobello 29·20 per head per day. It appears, therefore, that the water has been carefully and fairly distributed.

FOREIGN SHIPMENTS OF GAS AND WATER PIPES, GAS COAL, &C., FROM SCOTCH PORTS.—The following shipments from Scotch ports have recently been reported:—To Antwerp—malleable iron tubes, 8¼ tons £205; benzole, 9 tons 7 cwts., £385; malleable iron tubes, 13 tons 3 cwts., £198. To Charente—coal tar pitch, 150 tons, £225. To Civita Vecchia—gas coal, 992 tons, £2480. To Seville—cast-iron pipes, 1 ton 10 cwts., £12. To Barcelona—fire-bricks, 21 tons, £25; gas coal, 450 tons, £552, and 179 tons, £220. To Demerara—gas tubing, £27; products from coal, 2 tons, £10. To Sydney—cast-iron pipes, 31 tons 14½ cwts., £240; malleable iron tubes, £200. To San Francisco—fire-bricks, 212 tons 10 cwts., £216. To Lisbon—cast-iron pipes, 85 tons ¼ cwt., £630. To Valparaiso—cast-iron retorts, £150. To Havannah—cast-iron pipes, &c., 35 tons, £260 To Buenos Ayres—fire-bricks, 16 tons 4 cwts., £14. To Halifax, Nova Scotia—gas-meters and fittings, £138. To Trinidad—fire-bricks, 280 cwts., £13, and 1200 cwts, £28; fire-clay tiles, 330 cwts., £40. To Dieppe—coal tar pitch, 354 tons; gas coal, 100 tons. To New York—fire-clay pipes, 1 ton 2 cwts., £5. To Melbourne—cast-iron pipes, 60 tons 16 cwts., £350; malleable iron tubes and fittings, 225 cwts., £308; and 13 tons 11 cwts., £299; gas-meters, £5. To Berbice—gas-tubing, 4 cwts., £15. To Rotterdam—fire-clay blocks, £312; fire-clay pipes, £131 10s.; cast-iron pipes, 3 tons 19 cwts., £37; and 6 tons 17 cwts., £50; fire-bricks, £5.

MESSRS. R. LAIDLAW AND SON'S ANNUAL DINNER.—The fourth annual dinner of the managers, foremen, and other servants of Messrs. R. Laidlaw and Son, Alliance, Broomhill, and Barrowfield Engine-Works and Pipe Foundry, Glasgow, and Gas Apparatus Works, Simon Square, Edinburgh, was held in the Athole Arms Hotel, Glasgow, on Friday evening. Mr. David Laidlaw, jun., presided, and was supported by Messrs. John Thomson, Robert Murdoch, iron merchant; D. M. Nelson, contracting engineer for gas and water-works; John Page, C.E.; James Watson and William Waddell, Edinburgh; John Wallace, Cumbernauld Fire-Clay Works; Brand (Mirrlees, Tait, and Watson), Shaw, Firhill Pipe Foundry, and other guests. The croupier's chair was occupied by Mr. John Cassells, cashier, Alliance Works. Covers were laid for about fifty guests. After the loyal and patriotic toasts had been duly proposed by the chairman and honoured by the company, Mr. Watson, of Edinburgh, proposed the toast of the evening, that of "The firm of R. Laidlaw and Son." Mr. John Thomson, as the junior partner, responded in suitable terms. He admitted that the situation in which he was then placed was rather a strange one, that of having to reply on behalf of such an old and time-honoured firm; but its novelty could not prevent him referring to the reputation and world-wide renown for good workmanship in several departments connected with gas and water engineering. He sincerely regretted the absence of the venerable head of the firm, and spoke of the origin of the business in Edinburgh nearly a hundred years ago, and of the enormous extent to which it had now attained in Glasgow. Various other toasts were proposed and cordially pledged, including "The Foremen," "The Iron Trade," "The Edinburgh House," "The Outdoor Representatives," "The Friends Present," "The Ladies," "The Press," &c. That of "The Iron Trade" was proposed by Mr. Mayer, who rapidly sketched its progress in Scotland since the first blast-furnace was erected at Carron, in the year 1760, tracing the improvements made from time to time, and others that were still to be made. Mr. Murdoch responded, and mentioned many interesting reminiscences in connexion with the iron trade developments in and around Glasgow, and particularly with reference to the recent rapid advance of the steel trade in the district. The toasts were interspersed with some excellent singing and recitations, and a very happy evening was spent by the company.

Register of New Patents.

2481.—FEARNS, F. H., and JACKSON, W., Peckham, Surrey, "*Improvements in stoves for cooking and heating by gas, and in apparatus connected therewith.*"
Provisional protection only obtained. Dated July 16, 1874.

The gas is supplied to the burners or orifices at which it is to be ignited, combined with the requisite quantity of atmospheric air for its perfect combustion, thereby preventing the passing of any unconsumed carbon contained in the gas into the stove, and the unpleasant odours generally attending the use of gases for heating and cooking purposes. The stove is provided with a chamber of

suitable capacity surrounding the pipe or pipes through which the gas is made to pass. The atmospheric air is caused to enter this chamber, and is by means of orifices in one part of the chamber made to combine with the gas, and the combined gas and atmospheric air will be conveyed by suitable pipes or chambers to the burners or orifices where combustion is to take place.

At any desired height above the point at which the gas is ignited, trays are arranged in the framework of the stove, and these trays may be fitted in series, and over each of them may be placed hollow truncated cones when the section of the stove is circular, and hollow truncated pyramids when the section of the stove is rectangular. These truncated cones or pyramids are connected at their bases with the framework of the stove, and when the framework is enclosed at its sides, each tray may or may not be isolated from the tray above or below it, but if desired the trays may be enclosed in one case with a truncated cone or pyramid placed above the upper one only. Suitable openings or doors are fitted in the sides of the case to allow access to the materials being cooked, or if desired the whole case may be constructed to be raised by suitable pulleys, levers, or otherwise, and thus leave the trays holding the materials or articles being cooked fully exposed on all sides for inspection.

The products of combustion and the vapours from the materials being cooked are carried off by means of holes made in the case at a point just above the base of the truncated cone or pyramid, and these holes may be surrounded by an annular space or outside casing attached to the case, whence the products of combustion and vapours may be conducted by pipes fitted with valves or otherwise to a flue, or carried in any other suitable manner to the outside of the room or chamber in which the apparatus is placed.

2493.—HACHE, E. H., Paris, "*An improved mechanical apparatus for indicating by clockwork the excessive pressure of lighting gas.*" Provisional protection only obtained. Dated July 16, 1874.

The apparatus consists of three principal parts, a manometer, a clock movement with a bell put in communication by a balanced lever or float, the whole enclosed in a case from whence only the bell with its hammer is excluded.

The manometer is arranged as follows:—It comprises a receiver of glass, which is held within the apparatus by a little partition, and is provided externally with a graduated band. In its cover is fixed invariably at the middle of the receiver a long glass tube, which decends nearly to the bottom of the latter. To the lower end of this tube is fixed an armature or metallic case carrying a tube which debouches at the top in order to receive a flask or bottle, intended to maintain the constant level corresponding to zero in the graduated scale upon the receiver. The flask consists of a glass gauge provided with the armatures, the lower one of which serves it as a bottom, and is in a piece with the tube, while the other is provided with a loop piece with the grooved holes constituting a sort of bayonet-closing, very easy to open and shut. The tube descends nearly to the bottom of the other tube, and contains a small rod or triangle, which carries at its top the closing valve, which abutting against the closing stock and against the bottom of the branch of the tube, maintains the valve open. By this arrangement the constant level of the liquid is assured, and the mounting and dismounting of the flask is effected with great facility without the escape of even a drop of water. The float is formed by a long metallic hollow cylinder which is provided exteriorly with little fingers, intended to prevent it from rubbing against the partition of the tube, which would diminish its sensibility. This float is provided at its top with a handle, by the aid of which it is attached to the rock lever supported at the place of its articulation upon a cap forming a body with a square piece, which is adapted upon the metallic armature of the top of the tube. At its hinder part the lever is curved upwards, and closed in a sort of case in which a lining of leather, caoutchouc, or other convenient flexible material is embedded. The lever carries a counterweight, by the aid of which the movement for the action of the bell is regulated with all desirable precision. The clockwork movement is arranged so as to actuate the hammer, which produces the sounding by striking with successive blows upon the bell.

As soon as the pressure of gas rises above what is usual and necessary, the level of the coloured water rises in the manometer tube, and draws the float in its ascending movement. As soon as the float mounts, the lever moves upon its axis, and, descending, permits the escape of the disc. Immediately the mechanism causes the sounding of the bell, and by hearing it one is warned that it is necessary to go to the key of the entrance cock and turn it, so as to diminish the delivery of the gas. This will occur every time when in the establishment or outside there is an extinction of a sufficient number of burners to give rise to an injurious or useless excess of pressure. The apparatus will be easily regulated for a given excess with the aid of a counterweight. As to the liquid of the manometer, the waste proceeding from the evaporation will be found compensated by the water of the little reservoir or flask.

2495.—NEWTON, W. E., Chancery Lane, London, "*Improvements in the manufacture of inflammable gas for illuminating and other purposes, and in the apparatus to be used therein.*" A communication. Patent dated July 16, 1874.

The object of this invention is to eliminate, in the gaseous form, from coal or other suitable material, the hydrogen and carbon which are susceptible of displacement by distillation, so as to avoid the waste of these elements by the formation of non-inflammable gases and condensable compounds.

The invention consists in subjecting gas coal or other hydrocarbons to the process of distillation in a retort containing both a horizontal and vertical chamber, by means of which the volatile products given off from a fresh charge of coal in the horizontal chamber are gasified by passing directly through a more highly heated and partially carbonized charge of the same material, still emitting gas in the vertical chamber. By this means the votatile products eliminated from the coal while in the volatile condition, and before losing the heat acquired in the process of distillation, are converted into inflammable gas without the waste of the gas-producing elements.

In the ordinary manufacture of gas for illuminating purposes the waste of gas-producing material is known to be immense, and to arise from the formation of compounds other than inflammable gases generated during the manufacture of illuminating gas, and compounds too that contain the very elements required for the production of gas, and which amount to a far greater proportion of gas-producing elements than exist in the gas finally obtained.

The invention also consists in constructing retorts with both a horizontal and a vertical chamber, and in arranging pairs of such two-chambered retorts in a bench for the economical heating of the same.

2496.—WISE, W. L., Adelphi, London, "*Improvements in apparatus for purifying and filtering water.*" A communication. Patent dated July 16, 1874.

This invention relates to apparatus for the treatment of water hydrometrically. For this purpose the water is first caused to pass through a purifying apparatus provided with suitable introducing arrangements, wherein the water is treated by chemicals; thence the water is injected into a vessel containing a number of compound filtering cylinders, each composed of a metal tube perforated with holes for a part of its length, and surrounded by washers or layers of felt or other filtering material compressed between plates by means of screws. The filtered water collects in a lower chamber of the filter, whence it may be withdrawn as required.

2499.—FINCH, B., High Holborn, London, "*Improvements in self-regulating supply-valves for tanks.*" Provisional protection only obtained. Dated July 16, 1874.

This invention consists of a double-beat valve of equal or unequal area fitted to work in a casing, and operated by a lever to which a flattened float is attached, so that the slightest immersion shall cause the valve to act. Also of a chamber with strainer to retain sediment and serve as an air-vessel to lessen the concussion of the water when the valve closes.

2506.—CHIVERTON, E., Southsea, "*Improved means of and apparatus for lighting gas-lamps or burners.*" Provisional protection only obtained. Dated July 17, 1874.

This apparatus consist of a chamber with diaphragm therein, and weights tending to depress it, but of such amount that when a maximum pressure of gas is on, or a certain intended pressure is exceeded, the diaphragm and weights will be lifted, and the motion thereof will mechanically open one gas-pipe or passage and close another, both of which are fed from the under side of the diaphragm chamber. One of these pipes or passages leads to the main burner, and the other to a smaller or auxiliary burner, one or the other (but not both together) being intended to be constantly burning. The passage to the main-burner is the one to be opened by the high or maximum pressure, and that to the auxiliary burner to be closed by the lifting of the diaphragm.

The apparatus is further constructed with a tumbling shaft, rods, levers, or appliances (or mechanical substitutes or equivalents for them) in connexion with the weights, and so constructed or arranged as to counterbalance their effect or a portion thereof, and retain the passage ways to the burners in the open and closed positions notwithstanding that some reduction of the maximum or high pressure takes place; indeed, until it is reduced to or below an intended degree of lower pressure, when the weights, or one of them, will cause the diaphragm to fall and the passage to the main burner will be closed, and that to the auxiliary burner be opened.

The apparatus is specially intended for lighting or extinguishing the main burners of a number of street or other lamps by a simple alteration of pressure in the main, the apparatus being applied to each lamp or main burner.

2520.—JOHNSON, J. H., Lincoln's Inn Fields, London, "*Improvements in the separation of ammonia from illuminating and other gases.*" A communication. Patent dated July 18 1874.

This invention was fully described in the JOURNAL for March 2, 1875 (page, 297 of the present volume).

2526.—STRATEN, E. VAN DER, Antwerp, "*Improvements in apparatus for the combustion of air and gas for heating purposes.*" Patent dated July 18, 1874.

The object of this invention is to substitute a new conbination produced by a simultaneous combustion of the smallest quantity of gas, mixed by a mechanical process with the oxygen of the air, in lieu of other more costly fuel for heating purposes.

The apparatus consists of the following arrangement:—To an ordinary, or an india-rubber pipe, according to the locality, is applied a metal end, in which is fixed a jet of conical form, slightly lengthened. On this jet is adapted a hermetically-fitting pipe, so that the holes are axial in regard to the flame. This pipe or condenser is closed by a cap which forms the base of it, the under side being furnished with rectangular openings, with small square holes intermediately. This cap or moderator is also provided with metallic gauze, so that the current which is formed in the cap shall be permanent, soft, and regular.

The action of the apparatus is as follows:—The gas being lighted, the current which is formed in the cap drives the flame to the extremity of the pipe, and gives to it in its course a considerable intensity of heat; in effect, the oxygen which enters by the base of the cap is driven through the openings into the flame, and undergoes with this a concentration renewed without ceasing. It is consequently forced to diffuse itself in the pipe by the action of the current of air, thus producing a heat sensibly higher than that of a jet burning in free air. As there cannot be any humidity, or maintenance of humidity, if it is induced artificially (the horizontal portion of the plate being protected by a belt, preserving it even from the dust), it follows that the action of the current of air can never be deranged, and that there is always production of oxygen and forced condensation.

2546.—PERCH, W., and HIGGS, P., Cardiff, "*Improvements in the pistons of steam, air, gas, or vapour engines, whereby increased surface is obtained.*" Provisional protection only obtained. Dated July 21, 1874.

This invention consists in so constructing the pistons of steam, air, gas, or vapour engines, as that their acting surface shall be the surface of a paraboloid, or of a re-entrant cone, or of a cone, or of any mathematical figure giving a maximum surface.

2552.—HIGGINSON, A., Liverpool, "*Improvements in and connected with motive-power and pumping engines.*" Patent dated July 21, 1874.

This invention relates to motive-power and pumping engines fitted with a piston, one end of which reciprocates and the other end moves in a curved path, and consists:—In forming the steam chamber and piston pear-shaped, and in providing the tongue piece with a tightening piece, adjusted from the outside of the steam chamber. In making use of a hollow cylindrical steam admission-valve, contained in a recess, and caused to rotate by the piston. In employing a cylindrical expansion valve within or around the admission valve, and operating such valve by hand or a governor. In admitting steam to the engines by means of a gridiron valve, controlled by a taper cam, and governor operated by or from the main shaft. In enlarging the ports of the motive-power engines, and providing a self-acting stop-valve so as to apply them to pumping purposes.

2554.—HARRINGTON, J., and BRENT, H., Ryde, "*Improvements in gaseliers.*" Provisional protection only obtained. Dated July 21, 1874.

This invention relates to arrangements and combinations whereby the use of an hydraulic slide and of visible weights is dispensed with in gaseliers. For this purpose, instead of employing the ordinary telescopic slide with the packing fitted on the interior tube, a stuffing-box is fited on the exterior tube, with a packing space between it and the inner or fixed tube. The stuffing-box cover is cylindrical, and with a screw thread on the inside to fit a corresponding thread formed on the outside of the sliding tube. The stuffing-box cover is formed with another tube or ram to fit the interior of the stuffing box, and by preference is filled with silk. Thus by turning the cover the pressure on the packing can be readily adjusted, whilst it is prevented coming in contact with the screw threads. By these means a perfectly gas-tight joint is made, which is easily accessible for adjustment or repairs. The outer tube, instead of being the fixed tube as in ordinary telescopic slides, is the moveable tube, and to this tube the supporting chains are fixed. Instead of passing over pulleys, forming part of or carried by the gaselier, they are carried up into the space above the ceiling, and then passed over or fixed to a pulley, and acted by a weight or spring also above the ceiling to counterbalance the gaselier.

When using a spring there is employed in order to compensate for the varying tension of the spring a volute wheel or fusee, to which the spring is attached by a chain or cord or its equivalent.

2563.—CLARK, A. M., Chancery Lane, London, "*Improvements in steam-pumps.*" A communication. Patent dated July 22, 1874.

This invention consists in the combination with a main cylinder having steam ports and a piston-rod carrying a middle piston, and two pistons of cylinders placed at opposite ends of the main cylinder, having respectively a water inlet and outlet, and connected by a channel way, a continuous flow of water at the exit being produced. The invention also consists in the arrangement of the valves in the ends of the steam-chest for convenience of access.

2567.—WILLETT, G., HARRIS, R. J., and LUND, J., Worthing, "*Improvements in filtering sewage, and in the means for effecting the same.*" Patent dated July 22, 1874.

This invention for filtering sewage, house slops, and such like, consists of a

series of tanks made in brickwork or other material filled with coal ashes of various sizes, so constructed that the sewage will flow through the several compartments, and pass off sufficiently pure and clear to allow of the ordinary street channels being used, and by filling the last compartment with charcoal it may be rendered fit for any ordinary purpose.

2569.—NEWTON, W. E., Chancery Lane, London, "*Improvements in gas-burners.*" A communication. Patent dated July 22, 1874.

The object of this invention is to effect a more complete and effectual combustion of carburetted hydrogen gas than takes place in the burners now in general use. This is effected by adapting to the upper end of the burner a cylindrical cap made of metal, porcelain, or other refractory material, and in so constructing other parts of the burner that the gas may be compressed to a certain extent before it issues from the exit openings to be consumed. The invention is applicable to various constructions of burners, but the mode of adapting it must of course vary according to the peculiar construction of the burner.

For fishtail, bat's-wing, and burners of that class, the cap may be made to fit to the cylindrical part, so that it may be raised or lowered thereon as may be required.

For circular or Argand burners the cap may be simply allowed to rest on the circular edge of the burner, or to embrace the cylindrical part. The stem of the burner is screwed or otherwise fixed in the top of a small box or drum to which the gas is admitted from below. The gas is admitted to this box or drum through two or more inclined holes or short tubes, and becomes to a certain extent compressed. On issuing from the short tubes or inclined holes the gas strikes against the top part of the drum, then descends, and enters a drop tube, which is practically an extension of the stem of the burner. It will thus be seen that the gas does not pass direct from the supply-pipe to the burner, but first enters the drum, where by the pressure it is rendered more dense, and by being obliged to pass in a crooked or tortuous passage to the burner the pressure is equalized.

2572.—FORBES, Rev. G. H., Broughton Rectory, Northampton, "*Improvements in the manufacture of gas for illuminating and heating purposes.*" Provisional protection only obtained. Dated July 22, 1874.

This invention relates to improvements upon the invention for which letters patent (No. 4160, A.D. 1873) were granted to the present inventor. According to the former invention, chalk was combined with tar or pitch, or similar bituminous substance, together with a small quantity of naphtha or petroleum, or other light hydrocarbon oil or spirit, or animal or vegetable oil, or fat or fatty matter, or a combination of any two or more of them, which compound was used as a substitute for coal in the manufacture of gas, or for making quicklime.

According to the first part of the present invention, the proportion of naphtha or petroleum, or other light hydrocarbon oil or spirit, or vegetable or animal oil, or fat or fatty matter, is increased, and according to the second part chalk is combined with light or volatile tar oil or its equivalent, and tar or similar bituminous substance.

The proportion of the light or volatile tar oil or its equivalent employed varies considerably. The proportions of the naphtha or petroleum, or other light hydrocarbon oil or spirit, or animal or vegetable oil, or fat or fatty matter, will be about the same as those stated in the previous specification.

APPLICATIONS FOR LETTERS PATENT.

984.—PHILLIPS, W., Sheffield, "Improvements in water-closets." March 17, 1875.

994.—HOOD, W. C., Battersea, London, "An apparatus for regulating the flow of liquids." March 18, 1875.

999.—BROTHERHOOD, P., Notting Hill, London, "Improvements in apparatus for forcing or compressing fluids or liquids." March 18, 1875.

1007.—CLARK, A. M., Chancery Lane, London, "An improved motor." A communication. March 18, 1875.

1029.—BURNEY, G., Millwall, London, "Improvements in tank filters, part of which improvements is applicable for attachment of cement to other metal surfaces." March 20, 1875.

1040.—HILL, G., Liverpool, "Improvements in and applicable to gas-meters." March 22, 1875.

1053.—RAWLINGS, H., Southwark, London, "Certain improvements in the construction of filters for the purification of water and other liquids." March 23, 1875.

1058.—WALKER, W. T., Highgate, London, "Improvements in centre-valves." March 23, 1875.

1063.—SWANN, J., Old Jewry, London, "Improvements in gas-burners known as the 'Ellis gas-burner.'" A communication. March 23, 1875.

1077.—CHALLENDER, J., Manchester, "Improvements in apparatus for illuminating public clocks, which improvements are also applicable to other illuminating purposes." March 24, 1875.

GRANTS OF PROVISIONAL PROTECTION.

477.—SCHREBLER, G., Guben, Prussia, "Improvements in the construction of pistons for rotary engines and pumps, and in parts connected therewith." Feb. 9, 1875.

492.—JONES, H. L., Holborn, London, "Improvements in solid and liquid disinfectants and deodorizers." Feb. 10, 1875.

786.—SUGG, W. T., Westminster, London, "Improvements in lamp-burners." March 3, 1875.

818.—CHIVERTON, E., Southsea, "Improved means of and apparatus for lighting gas lamps and burners." March 5, 1875.

820.—WISE, W. L., Adelphi, London, "An improved continuous horizontal apparatus for washing or absorbing gas or vapours, or for distilling liquids." A communication. March 5, 1875.

826.—JOHNSON, J. H., Lincoln's Inn Fields, London, "Improvements in traps or apparatus for separating liquids from vapours or gaseous fluids." A communication. March 5, 1875.

833.—FARNSWORTH, S., Mansfield, Notts, "Improvements in valve apparatus for controlling the passage of water or other fluids." March 6, 1875.

838.—HUMPHRIES, J. R., Middlesbrough-on-Tees, "Improved apparatus for preparing the joints of leaden and other soft metal pipes." March 6, 1875.

839.—COOKE, J., Durham, "Improvements in the construction of rotary engines and pumps." March 6, 1875.

862.—MANN, W., Blackfriars Road, and OWENS, S., Whitefriars Street, London, "Improvements in valves." March 9, 1875.

892.—TAYLOR, F. B., Bayswater, London, "An improved steam-engine, also applicable for use as an air, water, or other fluid motor." March 10, 1875.

902.—CAREY, R., Southwark, and PORTER, R., Fenchurch Street, London, "Improvements in valves for regulating the flow or discharge of gas, water, and other fluids." March 11, 1875.

930.—FINDLAY, J., Glasgow, and JACK, W., West Calder, "Improvements in the destructive distillation of coal, shale, and other bituminous substances, and in the apparatus or retorts employed therefor." March 12, 1875.

938.—COOK, H. W., Essex, "Improved apparatus for pumping or exhausting liquids or gases and forcing fluids." March 13, 1875.

943.—TOMEY, J., Warwick, "Certain improvements in water-gauge glasses." March 13, 1875.

950.—COOKE, J., Durham, "Improvements in the construction of rotary engines and pumps." March 15, 1875.

NOTICES TO PROCEED.

3917.—PRESTON, F. P., PRESTIGE, J. T., PRESTON, E. J., and FOWLER, A. J., Deptford, London, "Improvements in pumps." Nov. 13, 1874.

3997.—ROBINSON, J., West Bromwich, Stafford, "Improvements in apparatus for charging gas-retorts." Nov. 21, 1874.

71.—ABEL, C. D., Chancery Lane, London, "Improvements in motor engines worked by gas or combustible vapour and air." A communication. Jan. 8, 1875.

425.—CROMBIE, E. E., Euston Road, London, "Improvements in dry gas-meters." Feb. 4, 1875.

622.—SPEIR, R., Greenock, and MATHER, J., Gateshead-on-Tyne, "Improvements in the manufacture or production of gas for illuminating or heating purposes, and for actuating gas-engines." Feb. 20, 1875.

696.—QUICK, J., jun., and RESTLER, J. W., Westminster, London, "Improvements in meters for measuring liquids." Feb. 25, 1875.

786.—SUGG, W. T., Westminster, London, "Improvements in lamp burners." March 3, 1875.

PATENTS WHICH HAVE PASSED THE GREAT SEAL.

3243.—PEACOCK, J. C., Finsbury Park Road, and BRADLEY, C. W., Circus Place, London, "Improvements in the manufacture of illuminating and heating gas and distributing thereof for use by means of apparatus adapted for said purposes." Sept. 22, 1874.

3269.—SPICE, R. P., Westminster, London, "Improvements in apparatus used in the manufacture of gas." Sept. 24, 1874.

3345.—WESTWOOD, W. H., WRIGHT, E., and WRIGHT, E. T., Worcester, "Improvements in stop or regulating valves for regulating or controlling the passage of liquids and gases through pipes or tubes, and for other like purposes." Sept. 30, 1874.

3829.—DODGE, J., Manchester, "Improvements in apparatus for exhausting or forcing air and gases." Nov. 6, 1874.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £50 BEFORE THE EXPIRATION OF THE THIRD YEAR.

721.—GRAY, W., "Improvements in rotary engines and pumps." March 8, 1872.

735.—HARRISON, C. W., and HARRISON, A. H., "Improvements in apparatus for heating and cooking by gas." March 9, 1872.

The GRAND MEDAL of MERIT at the VIENNA EXHIBITION has been AWARDED to

GWYNNE & BEALE'S PATENT IMPROVED GAS-EXHAUSTERS,

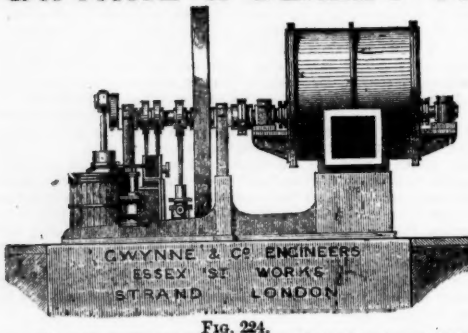

FIG. 224.

The BEST EXHAUSTERS IN THE WORLD.

Made under the personal superintendence of

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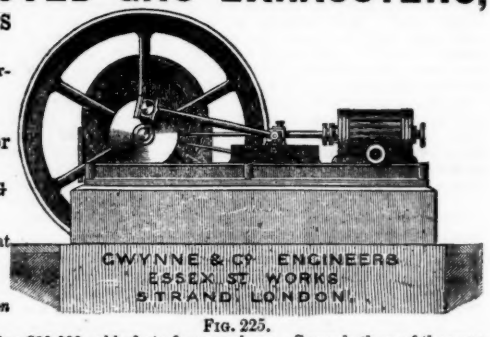


FIG. 225.

Fig. 224 represents one of those erected at the Imperial Gas-Works, Bromley, capable of passing 210,000 cubic feet of gas per hour. Several others of the same size are now on order for the same Company. These Patent Machines combine the highest quality of workmanship and materials, the largest bearings and wearing surfaces, with the **most perfect system of action yet discovered.** Fig. 225 represents one of a series of four at the Nottingham Gas-Works, each passing 52,500 cubic feet per hour. GWYNNE AND CO. *do not pretend to enter into a struggle with other makers in respect to cheapness. They have never sought to make price the chief consideration, but to produce Machinery of the very highest quality, and the most approved design and arrangement.* Their prices have been estimated with a due regard to the **excellence of the article produced,** and when this is taken into consideration, they have no fear for the result. The orders executed this season for Exhausters and alterations to their patented system amount to over 4,000,000 cubic feet of gas passed per hour, and to over 300 horse power for Engines to drive them. In every instance their work is giving the greatest satisfaction. Numerous testimonials and references can be given.

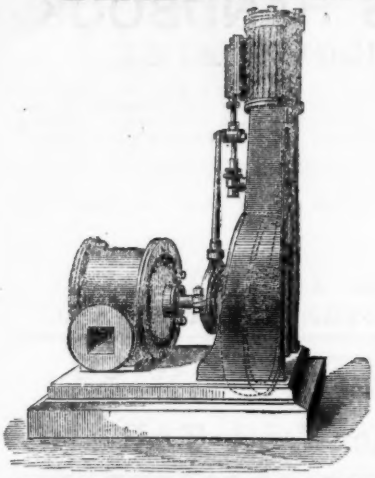
REGULATORS, BYE-PASSES, STOP-VALVES, GAS-VALVES, & MACHINERY FOR GAS MANUFACTURE, OF ALL SIZES,

CAN BE HAD ON APPLICATION TO

GWYNNE & CO., HYDRAULIC & GAS ENGINEERS, ESSEX STREET WORKS, STRAND, LONDON, W.C.

G. & Co. are now manufacturing for a London Gas Company three of their 210,000 cubic feet Patent Gas Exhausters, and many of all sizes.

BEALE'S IMPROVED PATENT GAS-EXHAUSTER

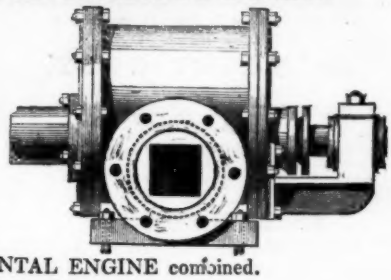


WITH

ENGINE COMBINED

ON

ONE BASE PLATE.



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GEORGE WALLER & CO.,

Who, since Mr. BEALE'S retirement, are the Oldest Makers.

EXHAUSTERS with HORIZONTAL ENGINE combined.
EXHAUSTERS with OUTSIDE BEARINGS.
MAKERS of ENGINES, BOILERS, and GAS MACHINERY.
TAR, LIQUOR, and SYPHON PUMPS. GAS-VALVES in stock, 2 to 30 inches.
SELF-ACTING BYE-PASS VALVES, with Lid and Relieving Lever.
MANN'S and many other descriptions of WATER DISTRIBUTORS.
SCRUBBERS, PURIFIERS, and CONDENSERS.
EXHAUSTERS from 3000 to 60,000, new and second hand, in stock.

PHŒNIX ENGINEERING WORKS, HOLLAND STREET, S.E., & at STROUD, GLOUCESTERSHIRE.

WANTED, a re-engagement as Manager. Advertiser has had thorough practical experience in every department connected with Gas-Works.
Address No. 143, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

TO GAS STOKERS.

WANTED, a leading Gas Stoker in a small Work, 8 miles from London, making about 8,000,000 per year. Wages 30s. per week.
Address No. 147, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED immediately, at a Gas-Work in the country, a steady and industrious Man as STOKER. Average wages 26s. per week, with constant employment.
Apply to SECRETARY, Gas-Works, Winsford, CHESHIRE.

WANTED, to purchase two good second-hand PURIFIERS, 7 ft. or 8 ft. square, with 6-in. connexions.
Address, SECRETARY, Gas-Works, Winsford, CHESHIRE.

TO GAS MANAGERS.

WANTED, by the Bingley Improve- ment Commissioners, a thoroughly competent and practical MANAGER for their Gas-Works. Annual make upwards of 30 million feet.
State age, and salary required, and post application and testimonials, by April 15, to J. N. THACKER, Clerk.
Bingley, March 25.

WANTED, a Situation as Manager of Gas-Works, making about 5,000,000 or 6,000,000. The Advertiser is a first-class retort-setter; also experienced in main and service laying, fixing meters, gas-fitting, &c. Good testimonials.
Address No. 148, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by the Advertiser, the MANAGEMENT of a small country Gas-Work. Ten years experience. Can produce good testimonials as to character and ability, and can work iron or clay retorts, lay mains, services, &c. Aged 34.
Address Mr. WALTER RHOADES, Gas-Works, Burnopfield, Lintz Green, DURHAM.

WANTED, by the Malton Gaslight and Coke Company, a thoroughly competent person to act as SECRETARY and Manager of the Works. Annual make about 16 millions. Security to the extent of £200 will be required.
Apply, in candidate's own handwriting, on or before the 5th day of April next, stating age, qualification, present occupation, and amount of salary expected, to J. S. CRANMER, Secretary.
By order of the Directors.
Malton, March 19, 1875.

CONTRACT FOR CANNEL COAL.

WANTED, Parties to Contract for the supply of CANNEL COAL, for the season 1875-6, to the Corporation Gas-Works, Forfar.
Sealed offers to be sent to the MANAGER at the works, on or before the 20th of April. The annual quantity carbonized is about 2000 tons.
The Advertisers retain power to regulate delivery.
Forfar, March 26, 1875.

REQUIRED, a practical Gas-Fitter, Main and Service Layer. Capable of repairing wet and dry meters.
Application may be made, stating age and former places of employment, to Mr. T. H. BOUTTELL, Manager and Analyst, Gas-Works, SLEAFORD.
Good wages will be paid to a sober and industrious workman.

COMPRESSED GAS ENGINEERS, MANAGERS, OR OTHERS.

SITUATION Wanted, as Superintendent or Foreman, by a thoroughly practical Man of good general experience. Thoroughly acquainted with every detail connected with compressed gas, and every description of gas regulator; also heating, lighting, and ventilation. No objection to travel.
Apply, by letter, to MAURICE, Post-Office, High Street, CAMDEN TOWN.

For Companies to issue to their Gas Consumers.

ADVANTAGES OF GAS FOR COOKING AND HEATING.
(NEW EDITION.)
By MAGNUS OHREN, A.I.C.E., F.C.S.

Specimen Copy by post Threepence, direct from MAGNUS OHREN, Gas-Works, Lower Sydenham, London, S.E.

THE ANALYSIS OF COAL GAS.—Mr. A. L. Sparkes, B.A., F.C.S. (Gas Examiner at Hanley, Stoke-Fenton, and Newcastle), gives Private Lessons in Photometry and Gas Testing.
Terms on application at Snow Hill Cottage, Shelton, STOKE-ON-TRENT.

FOR SALE, from 150 tons to 200 tons of COKE.
For price, &c., apply to SECRETARY, Gas-Works, Winsford, CHESHIRE.

WEST KENT GAS COMPANY.

FOR SALE—348 Iron-Cased Meters, "Cathels and Splats"—viz., 57 3-light, 229 5-light, 50 10-light, 11 20-light, one 30-light.
Can be seen on application to the Manager, at the works at Erith.
Tenders to be sent to the Secretary, R. P. KEYS, 237, SOUTHWARK BRIDGE ROAD, S.E.

PURIFIERS FOR SALE.

THE Cardiff Gaslight and Coke Company have for SALE four 12 feet square PURIFIERS, complete with wood sieves, wrought-iron covers, and convenient gear for raising; also faced centrevalve, with 15-in. connexion-pipes, all in thorough good condition.
May be seen at the works, or further particulars upon application.
HENRY BOWEN, Engineer.
Gas Offices, Cardiff, March 24, 1875.

TO TAR DISTILLERS, &c.

THE Directors of the Northampton Gas- light Company are prepared to receive TENDERS for the TAR and AMMONIACAL LIQUOR produced at their works for One year from the 30th of June next.
The Tar, &c., can be loaded direct into boats or railway tank waggons at the works.
Tenders, at per 100 gallons for the Tar, and also for the Ammoniacal Liquor, to be delivered at the Company's Office, Northampton, on or before Tuesday, April 20.
The Directors do not pledge themselves to accept the highest or any tender.
JOHN EUNSON, jun., Engineer.
Northampton, March 22, 1875.

IN CHANCERY.
In the Matter of the Companies Acts, 1862 and 1867, and in the Matter of the Coal Economizing Gas Company, Limited.

THE Creditors of the above-named Com- pany are required, on or before the 6th day of May, 1875, to send their Names and Addresses, and the particulars of their DEBTS or CLAIMS, and the Names and Addresses of their Solicitors, if any, to Mr. Charles Robert Tennant, of No. 8, Walbrook, in the City of London, the Liquidator of the said Company; and if so required by notice in writing from the said Liquidator, are by their Solicitors to come in and prove their said Debts or Claims, at the Chambers of the Vice-Chancellor Sir Charles Hall, at No. 14, Chancery Lane, in the county of Middlesex, at such time as shall be specified in such notice, or in default thereof they will be excluded from the benefit of any distribution made before such Debts are proved. Thursday the 27th day of May, 1875, at twelve o'clock at noon, at the said Chambers, is appointed for hearing and adjudicating upon the Debts and Claims.
Dated this 25th day of March, 1875.
WILLIAM BINNS SMITH, Chief Clerk.

Just published, price 10s. 6d.,

REGISTRATION OF DISTRIBUTORY PLANT.

The forms for this purpose are to illustrate the Paper on Distribution of Gas, read at the Edinburgh Meeting of the British Association of Gas Managers. By the use of the synopsis the whole of the out-door plant may at once be seen, with all matters pertaining to the same.
W. J. WARNER, Engineer.
South Shields.

TOTTENHAM AND EDMONTON GAS- LIGHT AND COKE COMPANY.

NOTICE is hereby given that a GENERAL MEETING of the SHAREHOLDERS will be held at the works, Willoughby Lane, Tottenham, on SATURDAY, the 10th day of April next, at Three o'clock in the afternoon precisely, to receive the Report of the Directors, and to declare an Interim Dividend.
The Transfer Books of the Company will be closed from the 27th of March to the 10th of April, inclusive.
By order of the Board,
JAMES RANDALL, Secretary.
Edmonton, March 27, 1875.

GAS-METER INDEXES, INDICATORS, TELL-TALES, &c.

A. BAILEY, 86, Crampton Street, New- ington Butts, London, S.E., manufactures every description of Worm and Wheel Cutting. Country orders executed with despatch.
N.B.—A. B. has for many years supplied some of the best London firms.

THE Newton-in-Mackerfield Improve- ment Commissioners invite TENDERS for supplying and fixing four 12-ft. PURIFIERS, Centre-Valve, &c., at their Gas-Works, Crow Lane, where the drawings and specification may be seen on application to the Manager, at the works.
Tenders, endorsed "Tender for Purifiers," to be forwarded to me not later than the 3rd day of April next.
The lowest or any tender not necessarily accepted.
R. BRIERLEY.
Town-Hall, Newton-le-Willows, Lancashire,
March 6, 1875.

The Commissioners will have for disposal four 6-ft. Purifiers, with dry centre-valve and 8-in. connexions, in complete working order, for which offers are invited.

TO GAS APPARATUS MANUFACTURERS AND CONTRACTORS.

THE Directors of the Lofthouse and District Gas Company, Limited, are prepared to receive TENDERS for the erection of GAS-WORKS, at Skinningrove, near Saltburn-by-the-Sea, in the North Riding of Yorkshire.
Specification and drawings may be seen on application to Mr. Alfred Upward, the Company's Engineer, of No. 8, Queen Anne's Gate, Westminster, London, from April 1 to April 7, between 11 a.m. and 4 p.m., or to Mr. John Dennington, Secretary to the Company, of 18, Baxter Street, Grange Road, Middlesbrough-on-Tees, from March 22 to March 29, between 11 a.m. and 4 p.m.
All persons applying to inspect the drawings and specification will be required to deposit a sum of three guineas, which will be returned within fourteen days of the date fixed for the delivery of tenders, provided such person or persons shall send in a *bonâ fide* tender, on or before the 15th day of April, 1875, otherwise the sum will be forfeited.
Sealed tenders, endorsed "Tender for the erection of Gas-Works," must be sent in, in accordance with the form given at the end of the specification, not later than the 15th day of April, 1875, addressed to the directors of the Lofthouse and District Gas Company, Limited, 18, Baxter Street, Grange Road, Middlesbrough.
The Directors do not bind themselves to accept the lowest or any tender.—By order of the Board,
JOHN DENNINGTON, Secretary.

THOMAS LAMBERT & SONS
MANUFACTURE EVERY DESCRIPTION OF
GAS AND WATER FITTINGS;
ALSO,
WROUGHT-IRON TUBES & FITTINGS.
SHORT STREET, LAMBETH, LONDON.

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For excellence of Fire-Clay Gas Retorts, and
"HONOURABLE MENTION" for
good quality of Fire-Bricks.
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THROCKLEY,
NEWCASTLE-ON-TYNE.

Price 3s.,
GAS PURIFICATION IN LONDON; including a Complete Solution of the Sulphur Question. By E. H. PATTERSON, late Metropolitan Gas Referee.
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May be consulted on all matters relating to the Manufacture and Distribution of Gas, including Inspection and Reports on Works, Foreign Concessions, Patented or other Processes.

Mr. ALFRED LASS,
60, CORNHILL, LONDON, E.C.,
Is prepared to open the Books, and, if necessary, keep the Accounts of Gas and Water Companies.
To examine the Books and Accounts, and prepare Balance-Sheets for the information of Directors.
To assist Secretaries in preparing Balance-Sheets, according to the "Gas-Works Clauses Act, 1871;" or may be consulted with respect to Accounts generally.

WM. RICHARDS,
INVENTOR OF THE DRY GAS-METER,
REVISER OF "HUGHES ON GAS-WORKS,"
CONSULTING GAS ENGINEER,
Advises on all matters of business connected with Gas Lighting. Furnishes Working Drawings of Retort-Settings, Specification of Works, complete or in detail.
11, ST. MICHAEL'S ROAD, STOCKWELL, LONDON, S.W.

TO INVENTORS AND PATENTEES.
MR. W. H. BENNETT, having had considerable experience in matters connected with Gas, Water, and Sanitary Improvement, begs to say that he continues to assist Inventors in the perfection of their designs, and to obtain for them PROVISIONAL PROTECTION, whereby their invention may be secured for Six Months; or LETTERS PATENT, which are granted for Fourteen Years.
Patents completed, or proceeded with at any stage, thereby rendering it unnecessary for persons resident in the country to visit London.
Patents procured for Foreign Countries.
Information as to cost, &c., supplied gratuitously upon application to the Advertiser, 42, Parliament Street, WESTMINSTER.

OXIDE OF IRON.—We are prepared to supply, on moderate terms,
HYDRATED PEROXIDE OF IRON (BOG OCHRE),
Same quality as supplied by us to several of the most extensive Gas Companies, and which has given entire satisfaction.
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Manufactory for every description of Casting and Machinery for Gas-Works and Water-Works.
Warehouse in London for Cast-Iron Pipes and Connexions of all sizes and in any quantity, Scott's Wharf, Bankside, Southwark.
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Red and Blue Clay Goods, Engineering and other Ironwork, and Fittings supplied.
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GAS MANAGER'S HANDBOOK.
By THOMAS NEWBIGGING, A.I.C.E.
The scope of this work is apparent from its title. The First Edition, published a year or two ago, was eagerly sought for, and has been now for some time out of print. The favourable reception accorded to it sufficiently proved that it supplied a generally acknowledged want in the profession. The work has undergone careful revision; much new matter has been added; and the New Edition is published in foap. 8vo., morocco, gilt.
"This may be fairly described as among the most useful manuals of its class."—*Iron.*
"Gas managers will find it a very useful companion."—*Chemical News.*
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SUPPLY FROM STOCK
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ROUND STATION-METERS,

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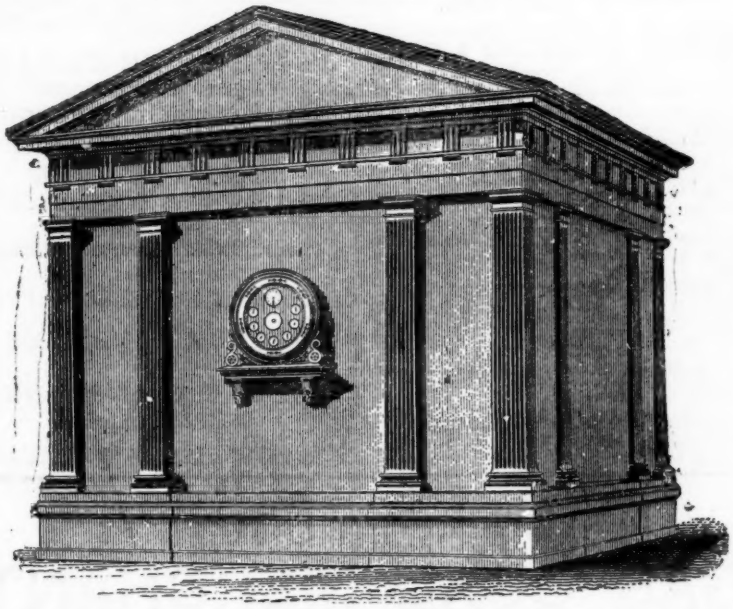

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RETORT SETTINGS, heated by tar without the production of smoke.

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FOUR-WAY VALVES, one of which is equal to three ordinary Valves.

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A Pamphlet containing Eighteen Illustrations of the foregoing, with letterpress on the construction of Works, post free, 2s. 6d.

N.B.—The second edition of this Work, *now ready*, contains Illustrations of the Machine for converting Breeze and Tar into Fuel for heating the Retorts.

"The Author is well qualified to speak authoritatively upon the important subjects to which his pamphlet refers."—*Artisan.*

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Which have now been used for twelve years, and their advantages and durability fully established. They are made entirely by steam machinery in very large quantities at the most moderate cost.

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Manufacturers of GAS-RETORTS, GLASS-HOUSE FURNACE & BLAST-FURNACE BRICKS LUMPS, TILES, and every description of FIRE-BRICK.

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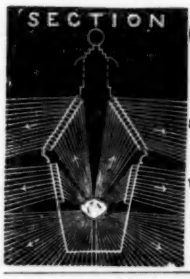

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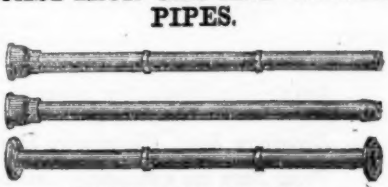

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Prices on application.

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MUIRKIRK, No. 1, CANNEL

Yields 12,160 cubic feet of 32·5-candle gas per ton, and 10 cwts. of excellent coke, containing only 5 per cent. of ash.

MUIRKIRK, No. 2, CANNEL

Yields 10,700 cubic feet of 32·77-candle gas per ton, and 9½ cwts. of coke, containing 11 per cent. of ash.

OLD WEMYSS CANNEL

Yields 13,320 cubic feet of 32·5-candle gas per ton.

Prices and full Analyses on application.

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Of every description delivered f.o.b. United Kingdom, or cost freight and insurance Abroad, upon lowest terms.

Contracts undertaken for the Shipment, Insurance, and Delivery Abroad of Plant and Materials for Gas and Water Works, &c.

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Which yields 13,265 cubic feet of 35·86 standard candle gas; and 973 pounds of good coke, containing 18·89 per cent. of ash.

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Which yields 10,538 cubic feet of 33·2 standard candle gas; and 1216 pounds of coke, containing 11·86 per cent. of ash.

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Which yields 10,575 cubic feet of 27·38 standard candle gas; and 1240 pounds of coke, containing 11·56 per cent. of ash; and

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Which yields 10,018 cubic feet of 21·97 standard candle gas, and 1260 pounds of very best splint coke. (This is also a first-class steam coal.)

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This Cannel produces in actual working, in iron retorts, 9200 cubic feet of 32-candle gas, and upwards of 11 cwt. of coke, and in clay retorts will produce 11,500 cubic feet of 25·9-candle gas.

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STRONGLY RECOMMEND A TRIAL OF THEIR

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Analysis by F. J. EVANS, Esq., Chartered Gas Company, Horseferry Road, Westminster:—

(COPY.)

	Cubic Feet of Gas per Ton of Coal.	Illuminating Power in Candles.	Coke per Ton of Coal used.	Ash in Coke, per Cent.	Sulphur in Coal, per Cent.
Silkstone Nuts . . .	10·800	15·85	12·66 cwt.....	6·0	0·69

NOTE.—The illuminating power of the gas was tested by the standard burner now used in London by the Gas Referees, under the City of London Gas Act, 1868.

Horseferry Road, Westminster, March, 1870. (Signed) F. J. EVANS.

These Nuts are extensively used by various Gas Companies throughout the Kingdom, who bear strong testimony to their value.

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Of superior quality, delivered at any station in England and Wales.

Purified gas per ton of coal in cubic feet (average)	**10,775**
Weight of coke in lbs. per ton of coal	**1,465**

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This Company request attention to the very superior quality of their Cannel Coals.

1. The following are the practical results given by Dr. Wallace, of Glasgow, of analyses of their Lochore and Capledrae Cannels:—

	Sample worked at Capledrae.		Sample worked at Lochore.
Gas per ton of coal, at 60° Fahr. and 30 inches barometric pressure . .	13,095 cubic feet.	..	11,760 cubic feet.
Illuminating power, in standard sperm candles, by union jet consuming 5 cubic feet per hour, at ·5-inch pressure	32·91	..	34·83
Value of 1 cubic foot of gas in grains of sperm	780	..	836
Equivalent of a ton of coal in pounds of sperm candles	1,459	..	1,404
Durability of 1 cubic foot by 5-inch flame	69 minutes.	..	71 minutes.
Gravity of the gas (air = 1000)	596	..	594

Remarks.—This (the sample from Capledrae) is a Cannel Coal of first-class quality, giving 13,000 feet of 33-candle gas. It contains only a minute proportion of sulphur, and the ash is almost quite white. The coke is of rather inferior quality.

Remarks on Sample from Lochore.—This is a Cannel Coal of first-class quality, giving a large yield of very rich gas and a coke of medium quality.

2. The following are the practical results of analyses by Dr. Wallace of the Company's Waverley Cannels:—

	Capledrae Waverley.		Lochore Waverley.
Gas per ton of coal, at 60° Fahr. and 30 inches barometer	9,120 cubic feet.	..	11,145 cubic feet.
Illuminating power, in standard candles, by union jet consuming 5 cubic feet per hour, at ·5-inch pressure	36·62	..	33·09
Value of 1 cubic foot of gas in grains of sperm	878	..	794
Equivalent of a ton of coal in pounds of sperm candles	1,145	..	1,264
Durability of 1 cubic foot of gas by 5-inch flame	80 minutes.	..	67 minutes.
Gravity of the gas (air = 1000)	677	..	597

Remarks on the Sample of Capledrae Waverley.—This Coal gives fully 9000 feet of gas of 36½ candles, and is admirably adapted for bringing up the quality of gas made from common coal or inferior qualities of cannel. The tests were made at a rather high temperature, this being one of the coals that stand a very high heat without serious diminution of the illuminating power of the gas The coke contains 60 per cent. of ash, and is therefore almost valueless, but the proportion of sulphur is very moderate.

Remarks on the Lochore Waverley.—This is a first-class Cannel Coal, giving 11,000 cubic feet of 33-candle gas. The quantity of sulphur is very minute, and the ash is nearly white. The coke is of inferior quality, but not wholly valueless.

Applications for full Copies of Analyses and Prices may be made to the Company, at

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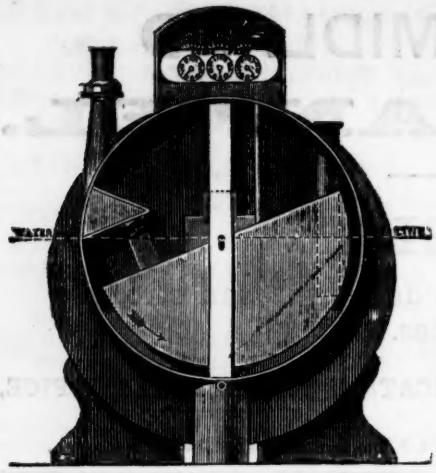

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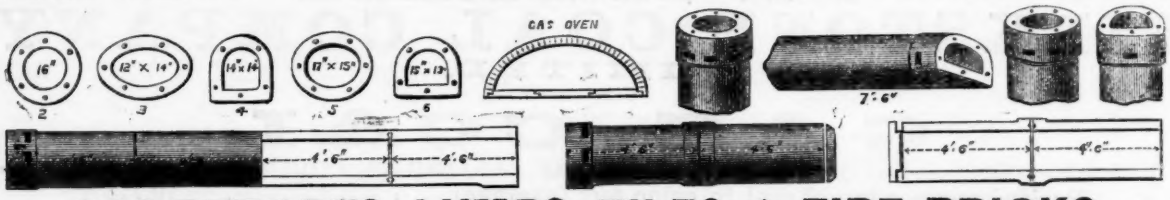

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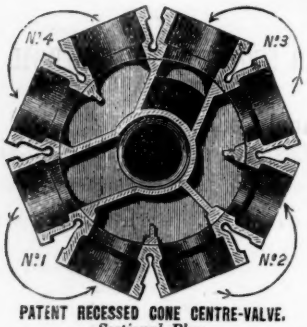

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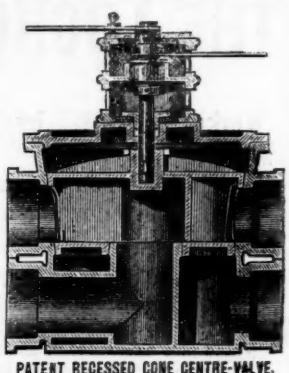

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